Vol 4 No 8

The Australian COMMODORE and AMIGA REVIEW

August $3*

Finding a top class disk drive

Reviews:

Road Runner
Freeze Machine
Eu[illegible]phony
Virtuoso
Eagles
Xevious
Flyspy
Trap

Programming:

User Defined Characters
Basic is Easy
Dice Roller
Fast Change Button

Regulars:

Super Column
Arcade Action
Machine Code

Registered by Australia Post Publication No NBG 6656

*Recommended retail price


FREEZE MACHINE
FREEZE
RESET
MACHINE
DISTRIBUTED BY
MICRO ACCESSORIES OF S.A.
MADE IN SA
Micro Accessories of S.A.

The Australian
Commodore and Amiga Review
Vol 4 No 8 August 1987

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Australian Commodore Review
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Editorial

NO DOUBT you welcomed the unannounced increase in thickness of last month's issue. Including the Amiga section, we now boast 64 pages of juicy magazine for you to read. Compare that with the overseas magazines landing at your newsagent for around $7 and you're talking value plus.

In the past we have encouraged your ideas, brickbats or bouquets. To the larger degree we have taken much notice of these. There are more programming articles, fewer games reviews, more tutorials, and starting this month we've added a guide to BASIC and machine code.

As far as possible, regular items such as Adventurer's Realm, Arcade Action and Paul Blair's Super Column, will appear.

Amiga articles will still appear in the main body of the magazine.

However, these will be directed at non-owners. That will leave more space for 64 users. If there's anything you'd like to see that we're not doing, please do write in as soon as possible.

This month, we examine all the disk drives Commodore has ever released, and explain just what they can and can't do. We also review the latest in alternative units, a slim-line from Micro Accessories.

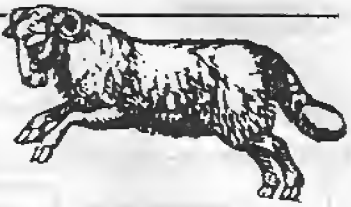
Jason Briggs continues his guide to User Defined Characters, and Eric Holroyd, our music man, examines *Virtuoso*. This program allows you to produce a stand-alone program that will play your tunes. Add to your own games for background music or effects.

Freeze owners will also be pleased to read about the lates version, now called the Freeze Machine.

Full review inside.

Enjoy.

Andrew Farrell



RAM RUMBLINGS

Commodore announces $100 million Indian contract

Commodore Australia announced a major contract with a multi-million dollar computer company in India.

The deal involves a five year $100 million manufacturing and technology transfer program with Commander Computers Limited of India.

Commander Computers is 60% owned by Commodore Computers Inc. of the U.S.A., 20% by the State Government of Orissa and 20% by public issue.

The contract involves the supply of computer components for final machine assembly in India and marketing throughout India by CC.

The completion of the negotiations were made by the Australian and Asia/Pacific Managing Director, Mr. Tony Serra, with the assistance of the Asia/Pacific Manager, Mr. Ron Webb.

Mr. Serra said, "A lot of time and effort from all areas of the Commodore Company went into the planning and negotiations to secure this contract."

The potential market in India is about 10% of the population base of over 700 million. In addition the Indian government has committed itself to a policy of having computers in every school within the next three years.

Mr Serra said, "The machine assembly will include the C64, 128, PC and Amiga products of the Commodore range." Prduction will start immediately and launch date for the products will be mid September with U.S.A. and Indian government involvement.

"We see India as a more lucrative short to medium term market for the computer industry than China. The simple fact of not having to overcome the barrier of machine and software language is a major bonus in dealing within the Indian market.

"In May 1986, we announced a five year plan for Commodore in the Australian and Asia/Pacific marketplace whereby we would be more aggressive and market orientated enabling us to become a $100 million company by 1990.

"The reaction to our push may very well see us at that level in the region by the end of fiscal 1988," Mr. Serra said.

$12 million printer agreement

Commodore Computers signed a $12 million agreement with Sydney based computer peripheral distributor IPL-Datron to market a range of PC printers.

Under the two-year agreement, IPL-Datron will supply laser, dot-matrix and thermal printers for Commodore. The printers will service the entire range of Commodore computers from the C64 for the home market to the complete range of IBM-compatibles and the Amiga for the business sector.

According to Commodore's Australia/Asia Pacific Managing Director Mr. Tony Serra, the printers will be tailored to Commodore's specifications.

Mr Serra said the agreement was the first regional deal made by Commodore which usually bought on a global scale.

"The Australian market is particularly sophisticated," he said. "While Commodore is relatively more successful in Australia than other parts of the world, we want to make a strong impact on the business market. This means we urgently need quality printers to match our business computers."

The agreement will position Commodore as a major market force in the business printer sector.

"The printers will be so keenly priced that it will be difficult for anyone to overlook them," Mr Serra said

For IPL-Datron, the agreement marks its biggest OEM contract.

IPL Managing Director Stead Denton said, "We believe this is the biggest OEM printer deal ever made in Australia.

"We were able to offer Commodore a range of printers which provided quality, market acceptance, versatility and adaptability to their need."

The printers include the Oki Laserline 6 laser printer which will be fully developed to HP+ specifications for Commodore, 10 inch and 15 inch dot matrix printers with single and dual 9 pin print heads and a no-impact thermal printer.

Mr Denton pointed out that IPL-Datron was a specialist OEM supplier to the Australian market, able to assure Commodore that they would not compete for sales.

"Our policy is that we never sell direct to government or corporations, an important aspect of Commodore's new thrust into the business market."

Mr Denton said that IPL-Datron was probably already the third largest supplier of printers to the Australian PC market.

"We don't show up in any of the industry surveys because we don't subscribe to them," he said. "The contract with Commdore will bring us very close to the leaders."

LETTERS

TO THE EDITOR

MPS 1200 vs 1541 problems solved!

I am writing to you in the hope that, through your magazine, no-one will have to go through the same situation as I was recently in. After many years of using a C 64, 1541 drive and 1525 printer (so many years the drive and C64 both cost me $699 each), I decided I needed a better printer, so eight weeks ago I bought a MPS1200 (for $489, they were $349 at the Commodore Warehouse Sale and racing out the door, when will I learn?).

As soon as I connected up the MPS1200 it became obvious there was a compatibility problem as the drive went crazy if the printer was on line and I tried to access the drive, I got "device not present", "file not found", "drive not ready" etc etc. So I rang Commodore: after ringing several times a day for several days and not being able to contact "technical support" I started to wonder if they existed (they are in meetings, on other lines, out to lunch, or "nobody seems to be answering at present, could you try again later") and so talked to "service" who couldn't help, except to refer me to a service agent who kept the printer for two weeks, found no problem, so kept the drive overnight, returned the lot saying they didn't know what was wrong but if it didn't go away to bring the lot back. After their first effort they had to be kidding. Again I rang Commodore, again "technical support" were regularly unavailable. Over the next few weeks I spoke to three other service agents but their lack of ideas of what the problem could be was so uninspiring I didn't let them have a chance.

Then, about two weeks ago I wrote to Commodore, no reply as yet. Finally I talked to Brian Fielding and crew from CTS (Commodore Tech Services of Carlton) who were at Commodore's Warehouse Sale. They thought a chip in the earlier 1541 drives may cause the problem so I bought a replacement, fitted it, and no more problems.

So, if anyone with an old 1541 is having trouble with a MPS1200 connected, changing the 901229-03 chip for a 901229-05 might save you a lot of trouble.

Stephen McEwen
Orange, N.S.W.

Printer compatibility

I recently purchased an MPS1200 Commodore printer to use with my C64. I must say that until I read a review in your magazine, about three months ago, I was unsure as to which brand of printer to

PRINTER COMPATIBILITY CHART

CPU TYPE	MPS 1250	DPS 1101	MCS 810	MCS 820	MPS 1280	MPS 2020	LP 806
64	YES	YES	YES	NO	NO	NO	NO
128	YES	YES	YES	NO	NO	NO	NO
128D	YES	YES	YES	NO	NO	NO	NO
Amiga 500	YES	NO	NO	YES	YES	YES	YES
Amiga 1000	YES	NO	NO	YES	YES	YES	YES
Amiga 2000	YES	NO	NO	YES	YES	YES	YES
PC 5	YES	NO	NO	YES	YES	YES	YES
PC 10	YES	NO	NO	YES	YES	YES	YES
PC 20	YES	NO	NO	YES	YES	YES	YES
PC 40	YES	NO	NO	YES	YES	YES	YES

N.B. Parallel connecting cables are not supplied with printers but are available as options.

Specifications subject to change without notice

purchase. I think after using the MPS1200 myself, that this is a very good quality printer.

My question is, if at a later date I update my computer from the C64 to an Amiga 500 or 2000 can I still use the MPS1200 printer.

I have been reading your magazine for the past two years and I think that the articles in it are very well put together. I especially like the machine code programs that are printed in assembly code.

Alex Martin
Ocean Grove, Vic.

Ed. *Any printer with a parallel port will work with the Amiga range. (see chart).*

Our magazine

Having just read the June edition of *Australian Commodore Review* I feel inclined to make a few comments.

I was not impressed with the article on Programmable Characters. It appears to be a verbose rehash of the contents of pages 108-114 of the Programmers Reference manual.

It is my opinion that the four pages devoted to this article could have been better used for things not in a book nearly every C64 owner has a copy of. The missing Adventurer's Realm or a few hardware reviews would have been better.

I was so impressed, however, with the article on the contents of Disk Magazine Six, that I am sending you a cheque for one. It seems to be exceptional value for $12. (I would also be very interested to read more about the "inexpensive digitiser" mentioned in that article.)

Michael Boyes
West Pennant Hill, N.S.W.

Ed. *It is a sad fact that not that many do have a Reference Guide. We get constant requests for memory maps all of which appear in the Guide. Glad you like the disk magazine — we'll keep it coming!*

Pen Pal

I just thought I'd write to congratulate you on an excellent magazine. I just bought my first issue and find it much better than the overpriced American magazines I used to buy.

How about starting a Pen Pal column? I think this would be a great idea. Could you please publish my full address. I would like to get in touch with anyone aged 13+, male or female who uses a 64.

Nic Atherden
7 Carter Street
Randwick, N.S.W

Ed. *Ok, Pen Pals start writing!*

Circuit diagrams

I am an avid reader of your magazine, although not yet a subscriber. I am wondering if you could possibly help me, or advise me on how to go about obtaining a circuit diagram for a Commodore C128D and the Commodore 1901 colour monitor.

I have been to see a number of Commodore stockists, and they all advised me to try Commodore themselves. However, after writing to them a number of times, the last time being on 2nd July 1987, it would appear to me that they are not at all interested in purchasers of their equipment, who may have technical enquiries to make.

Keep up the good work with your magazine, which as far as I am concerned is the best magazine on Commodore available in Australia.

Ricci Green
Belrose, N.S.W.

Ed. *Call Gabe at Sydney United Computers (02) 295 5088*

Printer Problems

I have a 128D with a Compute Mate-100 Parallel printer with a Xetec Suter Graphix Jr. interface. The problem is when I am using *Certificate Maker, Printmaster, Printshop, Dooble* or any graphics programs, the printout is only about 50 character wide instead of 80 character.

Please could you tell me how I can fix this problem as I have tried everything. I have switched all function switches on the Super Graphix, tried all of the print codes in the program and in the printer, it will print 80 character in text mode.

R.E. Melksham
Carole Park, QLD.

Ed. *A graphic dump is only 50 characters wide - you can't stretch out what ain't there.*

Garfield

I have recently discovered that the *Artist 64* can be used to combine the graphics with *Garfield*! I have also found out it also will work on *Teddy Bear-Rels of Fun.* You simply save your graphic with the *Artist 64* and then leaving your data disk still in the drive, type

Load"P-(filename)",8,1

and then when it has loaded type this :

Save"(CRTO>(filename)",8,1

But this will be a Cartoon and won't be able to be loaded normally as an Electronic Cartoon slide show.

Shane McGregor
Merrylands, N.S.W.

Presenting the Fabulous Freeze Machine

In a mere matter of manic moments you can speed up a load, save your favourite protected program or format a floppy. All this and more using the latest in frozen techno-gadgetry from Micro Accessories. Andrew Farrell, the man with more computers than a Commodore warehouse, donned his Bolle's for this report.

YES folks, it's all true - and I did write that intro. Kiss goodbye to *Freeze Frame 3B,D* or even *Freeze Frame Five.* They've gone one better and named it the *Freeze Machine.* This time there's two buttons, and two modes of operation.

Default power up mode displays a blue screen on a blue background. This is the fast load menu. Press the right button, and bingo, a red screen on a red background appears. This time you're in Lazer mode. Each of these mysterious menus provides a unique set of operations and commands.

The instructions included throw little light on the real capabilities of this device. Instead they make the whole affair sound more like an adventure game, complete with appropriate puzzles and mysteries to solve.

To quote a hint sheet I received on the device:- "Experimenting is by far the best way to learn more about this product".

What is it?

For the uninitiated, *Freeze Machine* was originally a copy device. It works by snap-shotting the entire memory of the 64. This is then compacted and rearranged before being saved to disk. The result is a fast load version of your favourite commercial program on disk, or cassette.

However, this latest version includes something more. A fast load system called Lazer Boot and a fast load system called Fast Load. Using the first format, normal programs may be converted to the Lazer arrangement, which stores data as USR rather than PRG files. The best part about the system is that you don't necessarily need the cartridge in place to use it.

Lazer Boot

A program(s) is saved at the start of your directory that acts as a boot up for the disk. In other words, load this little proggy first, and it transforms all future loads into Lazer speed. Simply select from a menu the program you wish to load, and away you go.

Sounds simple, but on my first attempt I discovered that either the loader is temperamental or I had followed the contorted instructions incorrectly. My program would not load and run. I asked Micro Accessories for better instructions. A hint sheet promptly arrived. I would have thought simple instructions rather than vague hints would have been better. Nevertheless, I pushed on and tried again.

To establish what the difference was between the fast load and lazer load system I tested both out and timed the difference. In the process of describing what I'm doing, I hope to throw a little light on how to use this product. Perhaps Micro Accessories would like to use the remainder of this article as a rough for their new instruction book.

Test Drive

(The rewritten instructions.)

How to Use the Fast Loader :- First, from the blue menu screen, format a disk. After fifteen seconds a directory of your disk will appear. Pressing the space bar will return you to the main menu. Now choose 'I' to install the fast boot.

After about five seconds, the disk directory will appear, this time with the files BOOT and MENU. Press the space bar to return to the main menu. You can now save files onto this disk.

At this point I exited from the *Freeze Machine,* and wrote a two line program that printed "I'M RUNNING" all over the screen. I saved this to the disk I had just prepared. According to the instructions, you can now BOOT the disk. Type LOAD"0:*",8,1 and the boot program loads the menu program which then loads the disk directory. This is then listed to the screen.

> "Experimenting is by far the best way to learn more about this product."

To LOAD and RUN a program, move the curser up to the appropriate line and press return. My program loaded, but the whole operation seemed to bomb out, and the run was never executed. I typed LIST and all seemed to be in tact. So, there is a glitch guys - hope you can fix it.

The FAST loader was fast. My program loaded in just under three seconds, compared with just under three seconds for a normal load. Mmmmm.. perhaps I should use a bigger program, so that the difference is more obvious. So, I dug up my trusty modified version of Easy Script. After 37 seconds of standard loading time it was in memory and ready to be saved onto the fast load disk. This I did.

Again, I loaded the BOOT program, and from the directory pressed return on the same line as the EasyScript file appeared. After just over eight seconds it had loaded.. but did not RUN! You don't necessarily need the cartridge in place for this option to work.

How to Use the Lazer Loader :- Simple. Do exactly as you did for the fast loader, except that now instead of SAVing files you want directly onto the LAZER BOOT disk, you must convert them. Select `U' for utilities from the red menu screen. Now choose the `x' option to convert files.

Insert a disk and press `Y' or `N' to choose which files you wish to swap over to LAZER format. These will then be loaded, and a prompt appears to insert the destination disk. I tested this option out using EasyScript, which is about 57 blocks long. This time loading was further improved down to an amazing 6 seconds. After being converted the file was slightly larger - up to 61 blocks.

Now the difference is obvious. The Lazer Loader, although more cumbersome to setup, is much faster. Rather than loading the menu from disk, the same program is built into the cartridge. When in position, just move to the right menu, get a directory and press return on the file you wish to load.

Freeze Facilities

This is the sensitive part of this device. By rights, I don't even feel sure I should be discussing it. Yes, it is for backing up programs. You can save your copied files to either Lazer or Fast load format. Or you can save it as a normal programs file - for use with Dolphin DOS or similar.

Novaload programs may be backed up, and there's also a game killer option. This little piece of trickery can try to turn sprite collision, and/or background collision off. This is great for trying to get through games that are just too tough.

Some caution is required. Only try this modification on your backup copy of the program in question.

Conclusions

Freeze Machine is without doubt a big improvement over earlier. There are a dozen more features I haven't mentioned, all menu driven. The only two downfalls are the obscure documentation and the fact that neither fast loader will correctly run a program. I hope both these problems will be fixed soon.

Just what the new snapshot facilities will copy is not a good subject for this magazine. However, I'm sure it is very good.

Micro Accessories will be publishing a newsletter to keep owners up to date with developments, so you will be well supported for the $108 this little baby costs.

Disk Drives Directory

by Andrew Farrell

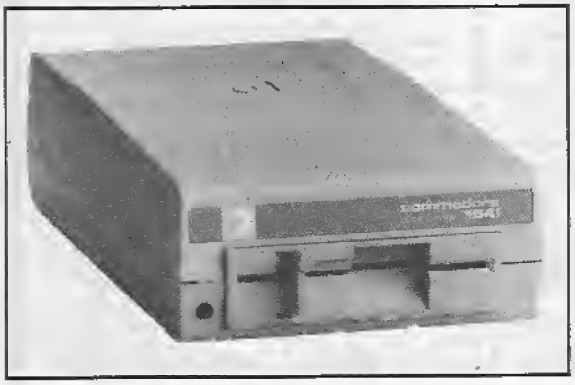
When we piled them on top of each other, even Commodore was surprised just how many existed. Add third party devices and you have one awful large selection to choose from. Andrew Farrell takes a guided tour of the range.

SMALL, fast, fat or thin. Different colours, speeds and capacities. Some compatible, some not so compatible. Which model will do the job you need, and where you can grab hold of some of those rarer models, is the subject of this article.

There are two main breeds available, serial and IEEE. The latter was designed for Commodore's older range of CBM machines. However, using an interface it is possible to operate an IEEE disk drive via the usual serial port. Bulletin boards commonly operate on these drives due to the large capacity. Program developers also find them useful for the same reason. With some variation, there are roughly six drives which fit the IEEE category. These all have obscure names and vary primarily in capacity and number of drives per unit.

Hard disks

Two hard disks are available. These have been copied in various forms by third party suppliers, and we may begin to see more of these readily available in Australia soon.



Imagine almost 8 Megabytes of storage and you have a top of the line D9090. At under $500, you can't go far wrong if you're considering a setup that requires high-speed mass storage. Higher capacity is available for a whole lot more bucks. In fact a total of $1850 will buy you a 10 Megabyte ST10C, Miniscribe drive with Commodore interface. Both the D9090 and the ST10C can be purchased through Graham Lee.

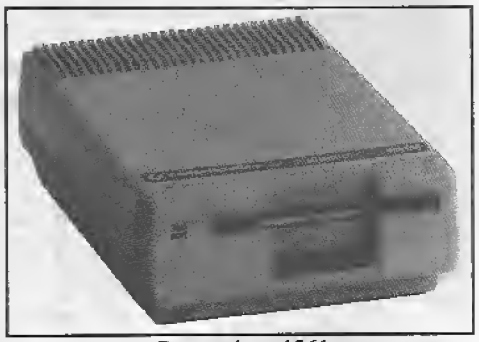
The man who pioneered bulletin board systems in Australia is now not only selling the software to run them, but the hardware as well! Catch Graham during the day on (02)665 0111 - and don't forget to mention where you saw his number.

He also sells the Leading Edge IEEE interface, a necessary evil if you plan to use any IEEE device with a Commodore 64.

Both the D9090 and its smaller cousin, the D9060 are cumbersome and heavy. The smaller version has a meagre 5 Megabytes of storage. Once up and running, both these beasties are best left alone. Parts may be hard to come by, and not all dealers can service these older units.

Dual drives

In our next category are the IEEE dual drives, which are still around in good number. The 8250 and 8050 are very similar. The former boasts just over 1Megabyte per drive, whilst the other is just on the 520K mark. Both require double sided double density disks to operate reliably. These are a little more expensive than usual.

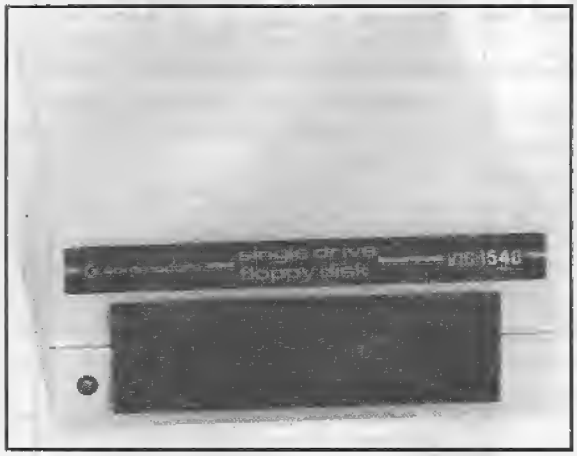


Commodore 1561

Once again, an ideal way to set up a BBS system that may have several disks full of software for downloads. These can be mounted or removed from the floppy drives, whilst a hard disk does the job of keeping track of members and messages.

The DOS format of all the 8250 and 8050 is NOT compatible with the 1541. However, the dual drive 4040 and single drive 2031 are close enough to be able to read and write 1541 format disks 99% of the time. These are often used for disk software production.

Some IEEE interfaces support DOS 4.0. This means you can use simple commands to copy or format disks. Alternatively, why not purchase an old PET, and like I do, use it for achieving or just a spare computer to view disk directories.



Single Serial drives

Now to the more familiar names such as the 1540, 1541, 1570 and 1571. One not so familiar might be the 1561. This miniature drive, the one on top of the pile on the picture, is a 3 1/2 inch version of the 1541. It was never released in Australia, and you can't buy one anywhere that I know of. It was slightly faster, and more reliable than its big brother, but never made the big time.

Vic 20 owners may remember the 1540. Originally in a creamy colour, it was the first single drive that followed the new sleeker styling of Commodore's consumer range. The sleeker lines I refer to are those which followed the demise of the

Commodore CBM 8040

COMMODORE DISK SYSTEM SPECIFICATIONS

MODEL	D9090	D9060	8250	8050	4040	2031
Drives per Unit	1	1	2	2	2	1
Heads per Drive	6	4	2	1	1	1
Formatted Storage Capacity per Unit	7.47 Mb	4.98 Mb	2.12 Mb	1.05 Mb	340 Kb	170 Kb
Max Sequential File	7.41 Mb	4.94 Mb	1.05 Mb	521 Kb	168 Kb	168 K
Max Relative File	7.35 Mb	4.90 Mb	1.04 Mb	183 Kb	167 Kb	167 K
Disk System Buffer RAM (Bytes)	4 Kb	4 Kb	4 Kb	4 Kb	4 Kb	2 Kb
DISK FORMATS						
Cylinders (Tracks)	153	153	77	77	35	35
Sectors/Cylinder	128	192	–	–	–	–
Sectors per track	32	32	23-29	23-29	17-21	17-21
Bytes per sector	256	256	256	256	256	256
Blocks Free (Unit)	29162	19442	8266	4104	1328	664
TRANSFER RATES (Bytes/Sec)						
Internal to Unit	5 Mb	5 Mb	40 Kb	40 Kb	40 Kb	40 Kb
IEEE-488 Bus	1.2 Kb	1.2 Kb	1.2 Kb	1.2 Kb	1.2 Kb	1.2 Kb
ACCESS TIMES (Milli-seconds)						
Track-to-track	3	3	5	*	30	30
Average Track	153	153	125	**	360	360
Head settling time	15	15	–	–	–	–
Average Latency	8.34	8.34	100	100	100	100
RPM	3600	3600	300	300	300	300
* Track-to-track:	Micropolis 8050 = 30 ms. Tandon 8050 = 5 ms.					
** Average Track:	Micropolis 8050 = 750 ms. Tandon 8050 = 125 ms.					
PHYSICAL DIMENSIONS						
Height (in.)	5.75	5.75	7.0	7.0	7.0	5.5
Width (in.)	8.25	8.25	15.0	15.0	15.0	8.0
Depth (in.)	15.25	15.25	13.75	13.75	13.75	14.25
Weight (lbs.)	21	21	28	28	28	20
ELECTRICAL						
Power (watts)	200	200	60	50	50	40
Voltage (all Models)	110 - 120 VAC, 60 Hz					

boxy PET range.

The primary difference between the 1540 and the 1541 is that of speed. Although the 1541 will work with a Vic 20 the 1540 will not work with a Commodore 64 unless you issue a special command. All of this is of course irrelevant since the 1540 is no longer available.

Its successor operates at around 300 CPS, which is slow by any standard. Since its release there have followed a swag of speed-up devices ranging from plug-in cartridges to complete ROM changes and cable variations.

As an interim step to supporting the newly released C128, Commodore provided the 1570. Much higher data transfer rates are supported, however only single sided formats may be read. The 1571 solved this problem, providing a drive which is reasonably compatible with the 1541 whilst being able to handle a host of new formats.

Big Blue Reader demonstrates the flexibility of this new drive very well in that it reads and writes MSDOS disks with ease. The same drive is also capable of reading and writing single and double sided MFM CP/M formats including EPSON QX-10, IBM-8 SS and DS (CP/M 86), KAYPRO II and IV AND OSBORNE DD.

C128 owners can only make use of the 1571's improved facilities in 128 and CP/M mode. For compatibility purposes it's often handy to have a dinky-di 1541. Copy protection on many games is exceedingly fussy, occasionally refusing to work with the newer drives.

For the Commodore 64 owner, several options are available following the release of a range of 1541 compatible units. It's true that to be on the safe side you can't beat the genuine thing. However new pricing and increased reliability on some of the alternative offerings are very attractive.

One of the best combinations is that of a 1541 with the legendary Dolphin DOS as supplied by Micro-Accessories. You will then have a state of the art high speed disk system that is not only compatible but reliable. If you can't afford the $170 this extra luxury will set you back there are cheaper alternatives.

Two very popular choices are the Cockroach Turbo ROM, which is a replacement ROM for the computer, and the EPYX fast load cartridge. Both offer additional commands to make better use of the improved loading speeds attained.

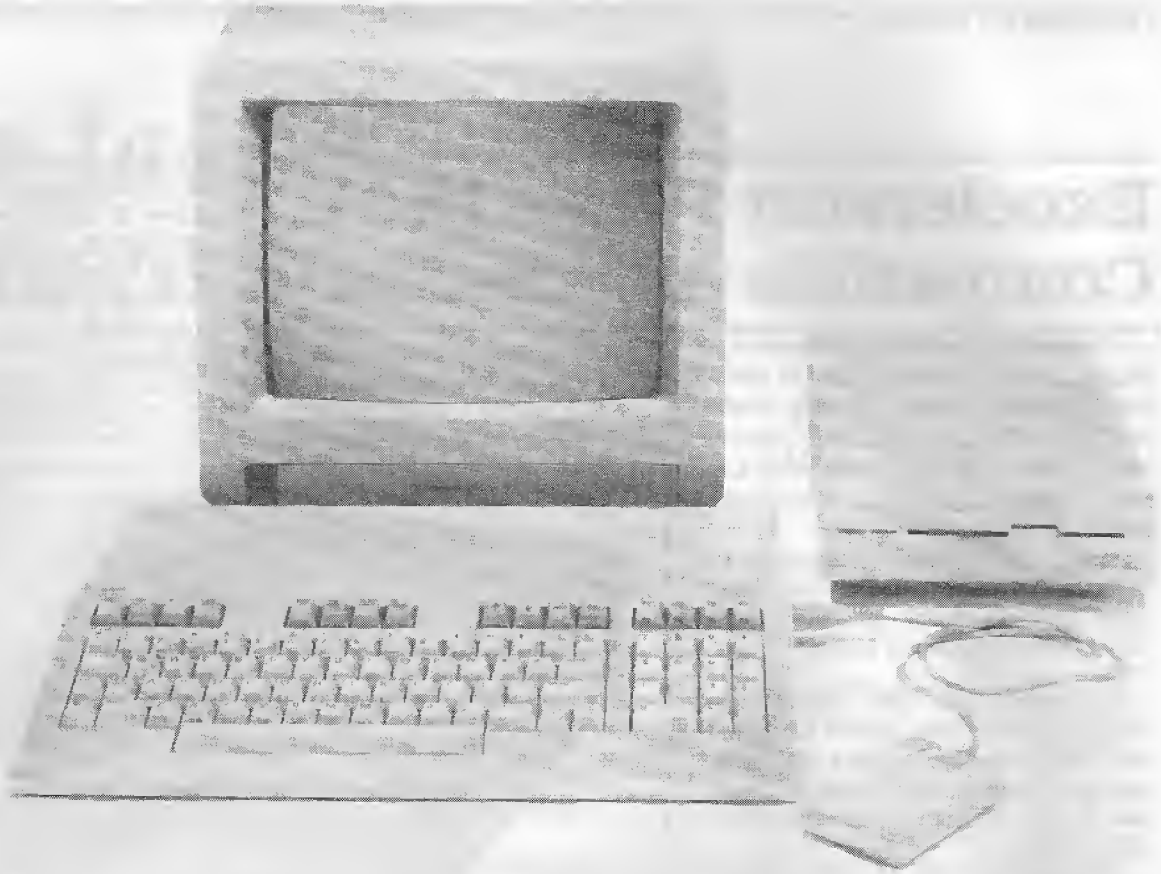
At this time we're on the brink of a new ROM release for the 1571. I can only recommend that you delay any purchases where possible until the upgrade has taken place.

Conclusions

Purchasing a disk drive is a very important step to upgrading your system. You'll never go back to using cassette, and your software collection will probably grow at an alarmingly faster rate.

For serious use, some of the older drives offer excellent levels of reliability whilst greatly increasing storage space. Beware that IEEE cartridges inevitably destroy some compatibility, however in certain applications that is no consideration.

Personally, I would never do without my trusty 1541. However, the old 4040 is invaluable for backing up disks using our equally old CBM 4032. Many Bulletin Boards are operated successfully using an 8250 or the more recent 1001 drive, which is basically a single drive version of its predecessor.



The Commodore 128

...so powerful, it's 3 computers in 1

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Excelerator Plus - 1541 Compatible Alternative

Sleeker, slimmer and stylish. Boasting greater reliability and its own external power supply for less heat problems, Micro-Accessories Excelerator Plus looks like a hard drive to beat. Andrew Farrell put it through the lab.

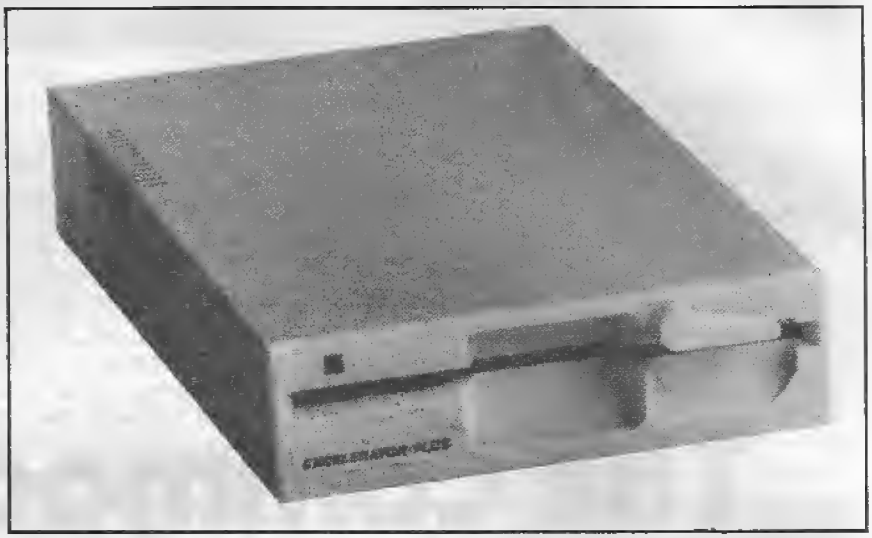
I'm always interested to examine a substitute for the 1541. There is so much room for improvement. One such disk drive that is a fair swap is the Excelerator Plus.

Far smaller than a 1541, and substantially lighter, the Plus is a more attractive unit from the start. Housed in a rigid metal casing that's about two thirds as long and four fifths as wide as the old trusty, it's also a lot squarer.

Imagine the actual dark area of the 1541 and you have the height and width of the PLUS. Inside, the circuit board wraps around the drive mechanism. There's no room for a Dolphin DOS, or similar speed up device. Only one of the chips on our review model was socketed.

The drive mechanism is similar to that of the latest 1541, with a swivel door. The disk slot is not spring loaded, and the disk sits well inside the drive. On several occasions I inserted two disks together, as the first was not visible!

A single LED provides an indication of power, drive in use and errors by displaying either a green, red or flashing red light respectively.



In operation the PLUS is deathly quiet. The familiar drive knock still occurs, but after hours of testing we experienced none of the alignment problems of the 1541. Heat dissipation is not a problem, since this unit has an external power supply that is connected using a din plug. At the back of the unit, there is a rocker switch for power and three din sockets next to each other.

Two provide serial input/output, whilst the last connects the power cable. Underneath the unit is another surprise. Dip switches allow you to select between device 8, 9, 10 or 11. Far simpler than unscrewing the case of your 1541 and soldering a wire link!

None of the games we tested had trouble loading, but as with all of these types of things, compatibility problems don't normally show their head until further down the line.

Conclusions

At this stage, I could safely recommend the Excelerator PLUS as a viable alternative for the 1541. It operates smoothly and consistently. For crowded desks, the PLUS has a tight foot print, and a quiet disposition. On the advertisements we are assured that it is faster than a 1541.

During a few simple comparison tests, the only operation in which the PLUS excelled at was formatting a new disk. (See Table). The final crunch is price. Estimates are as low as $350, so it sure is competitive.

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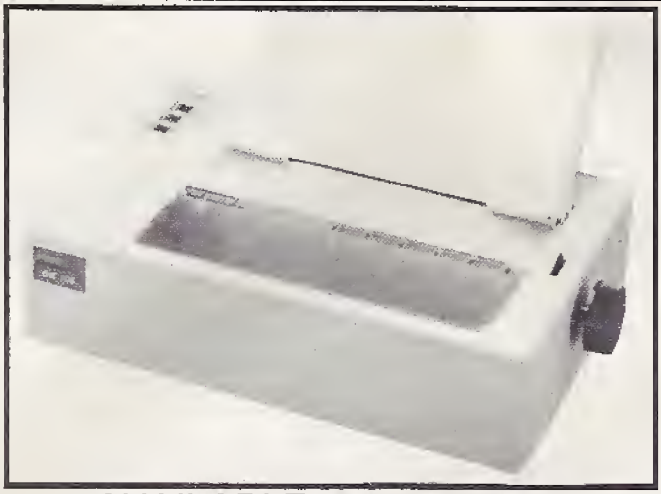

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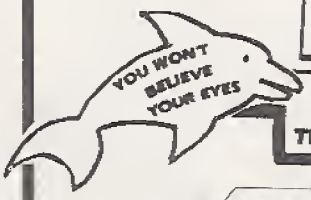

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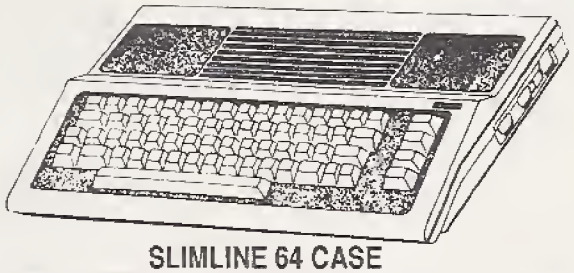

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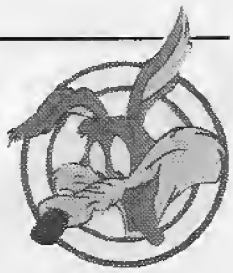
ROAD RUNNER



by J. Mark Hunter

THE caption across the front of the package reads, "Cartoon's most elusive character has finally been trapped." And that is indeed front page material. A feat of near impossibility, the greatest challenge known to modern man and coyote. But it gets done this time. Yes, you'll finally see it happen people - the ambush of the *Road Runner*.

Popped up on screen, *Road Runner* quickly became my favourite game for 1987. Just being able to delve back to the happy days of a life when you had time to watch the cartoons, and always time for the sarcastic whims of the supercilious Road Runner.

Well, now they're taking place again on screen, but with you behind the wheel. The opportunity is here to control the mayhem maneuvres of the desert bird and out- distance the mean-mouthed Wile E. Coyote.

Unfortunately, the Road Runner suddenly looks like becoming an endangered species with a less than fine-tuned precision mind such as a human's directing his step. He never got caught before, but as we learn the new U.S. Gold game, we go through so many trials and errors trying desperately to keep ahead of the hotly-pursuing coyote, that the Road Runner suffers a crucial blow to his outstanding reputation.

There is an opportunity here for Wile E. Coyote to finally get this elusive prize and it's up to you to keep his opportunity from knocking less than thrice, or it's Road Runner burgers tonight!

For a change we're cruising left of the screen, backtracking through the traffic flow and sailing downstream. And they're off to the simulated tunes of the Warner Bros theme track and object number one is to keep ol' Roadie fueled up with strategically deposited birdseed.

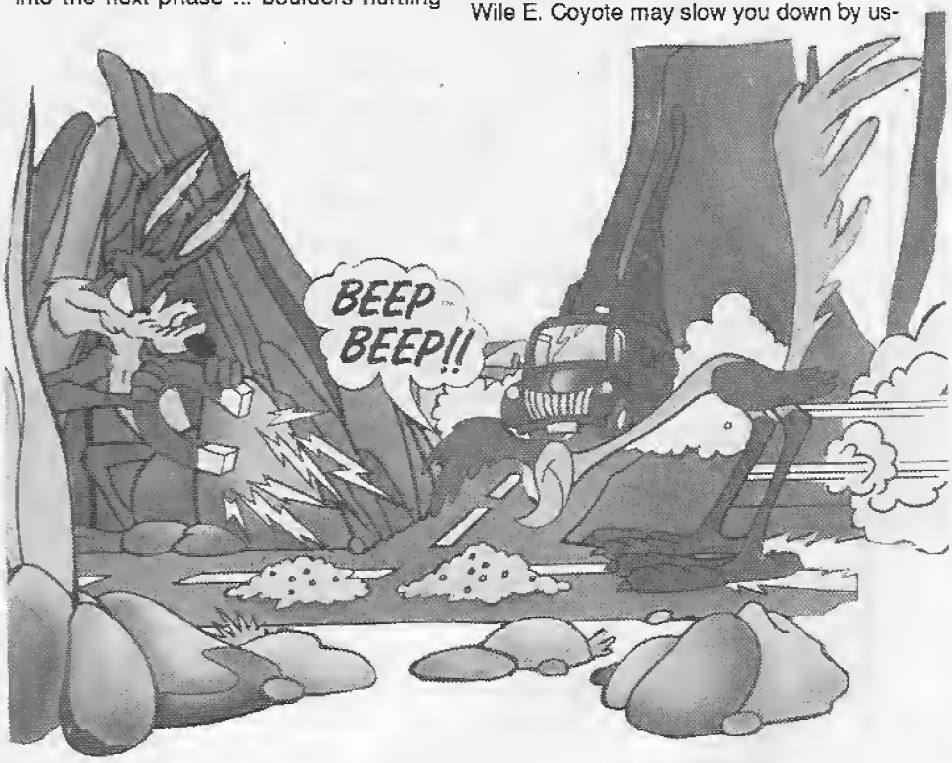
With the wolf-type creature rocking hard on his fouled feet it becomes your duty to outmaneuvre the wolf firstly into the New Mexico desert freeways and into the traffic. Don't get yourself run over here or you of course lose a life, but if the coyote gets it we're talking an extra half thousand points.

> "Cartoon's most elusive character has finally been trapped."

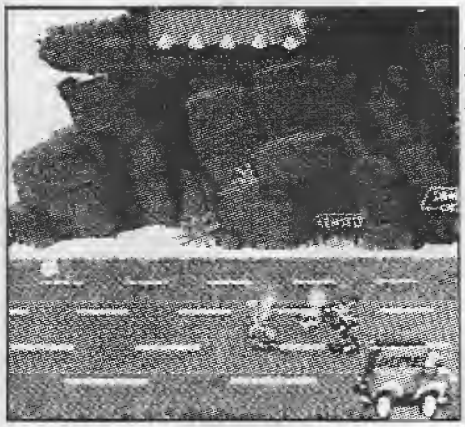
Then it's a class A racing circuit through fabulous twists and bends with a so-sweated chase through the curves it kills you! You think you're just about out of there and BANG! the coyote straddles a rocket and he's turboed himself within his first possible reach. His finger prints are on the Road Runner's tail feathers and ... no, the kid gets away and you're into the next phase ... boulders hurtling down from an Arizona cliff face and check this one out - the coyote has this souped up pogo stick and you don't know where he's going to be bouncing next! It's a marvellous game!

And it just gets tougher and tougher, folks. Enjoyment absolutely chokes your pleasure chords and being impressed just comes naturally. The antics of the characters, the graphics in dynamic clarity and detail and the changes of tune each phase of the game to even the Lone Ranger rhythm sections is quite a piece of entertainment.

Here's a few things to remember: keep eating the seed. It's quite worthwhile because if you get them all in each phase you get an extra 10,000 bonus points. If you should miss five of the seeds you will faint and also lose a life. Upon eating seed containing iron filings Wile E. Coyote may slow you down by us-



GAME OF THE MONTH



ing his magnet.

Mines will explode if Road Runner or Wile E. Coyote run over them. A bonus is given for jumping the mines or leading Wile E. over them. Road Runner kisses another life away if he suffers the same industrial coma.

Refreshment? If R.R. or the coyote runs over lemonade he/she will stop and drink it. Bonuses are gained if you drink all of the lemonade at the end of the level. You will also score points if either drink the lemonade.

Then, within the manual we come across a heading entitled: "Tongue Bonus." ...we all have our various personal definitions, but the guys at U.S. Gold explain themselves this way, "Take a risk and let Wile E. Coyote move in close to you, then run away and a bonus is scored as Road Runner pokes his tongue out at W.E. Coyote."

Oh.

Boulder avoidance really goes without saying, as does invisible bridging with a leap and a bound, and getting the foxy coyote to miss step on these pathways.

And a major helper is the invisible paint that Road Runner can run across causing his instantaneous disappearance, thereby making him most difficult to ensnare. Ah, but the coyote can do it too, and if that happens, a collision of calamitous desert fauna air space can occur. Everybody loses a life.

All told, *Road Runner* is a totally magic program. The delight that is induced in accomplishing a few phases of this game is worth publishing. They've really done well in perfecting classic manipulations in the program's design, and with the extremely good graphics and colour harmonized with such an artful creation, you're looking at a very worthwhile investment in your time and wallet depreciation.

If you want the chance to see the cartoon psychopath finally get that smart bird, then hook into this outrageous new program and don't stop until wolf is away from your door!

ROAD RUNNER	
Publisher	US Gold
Distributor	Ozisoft
Machines	C64
Price	C $29.95
	D $39.95
Graphics	92
Sound	76
Music	88
Presentation	90
Documentation	94
Overall	**96**

Eagles...metallic monstrosities of the 29th century.

The year is 2846, not to be mixed up with 2845 when the last intergalactic su-

perfight went down, I think about two issues ago now.

The "three hundred year war" rages on, party fever in the dance district. "Having learned their lesson over eight hundred years ago the peoples of the world have universally outlawed nuclear-weapons."

So they've outlawed nukes huh? At least that's something. I wonder what year? They never say. Probably just happened at the beginning of 46 because in 2845 they were still hovering over the button.

But now what's happening in some programmer's undernourished mind is that "genetically created beings" are destroying things, any things. The heroes now, as in yesteryear are the skilled pilots who man the deadly Eagle Fighters flying them against the alien hordes and engaging in dogfights with enemy pilots...good thing they don't dogfight with their buddies!

One more quote, "You leap to the cockpit of the most advanced fighter the Earth has ever known." No, not Rambo, the Eagle! With G-Turbo Engine throbbing and blasting into super life! The Xeno-Photon Cannon and lasers and lots more, just sends that tingle up your spine, don't it just...

Your mission is to destroy all the alien hordes, naturally, and collect the enemy's Message Droids, delivering them to your underground base by dropping them down the pipe located on the planet landscape. As your skill improves and you clear more levels a new weapon becomes available to you—a devastor device. Sounds lethal. Is it? Well, activated, the Devastor Device destroys all planetary

aliens with one flick of the switch. Nuclear Mortein, ch?

Then, when that area is cleared, you move on to battle the Zetafighter. If you defeat Zeta you gain large rewards, bonuses and units of energy. If you lose, well, don't bother hanging onto the key to the executive john, buddy, cause they won't want to see your face around here anymore.

All in all, what we have is some pretty amazing graphics and sensational, very sensational sound. Oh that sound! I'm mindfully blown. The similarity to actual jet engines roaring from a distance then overhead is superb and equated with very fancy maneuvering on the ol' joystick. Hewson always comes up with dynamite stuff.

A double screen of colonial-Uridium type landscaping, with hotted up aircraft and edgy, fist-beading play. It's a frantic-dash through the moonbeams and a battle to the computer death. I can't tell you much more, cos this is all I've seen of 2846. But in 1987 *Eagles* is a game worth playing, even if you have to spend money to do it.

EAGLES

Publisher	Hewson
Distributor	Ozisoft
Machines	C64, Amstrad
Price	C $29.95
	A $39.95
Graphics	82
Sound	93
Music	87
Presentation	74
Documentation	77
Overall	**79**

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XEVIOUS

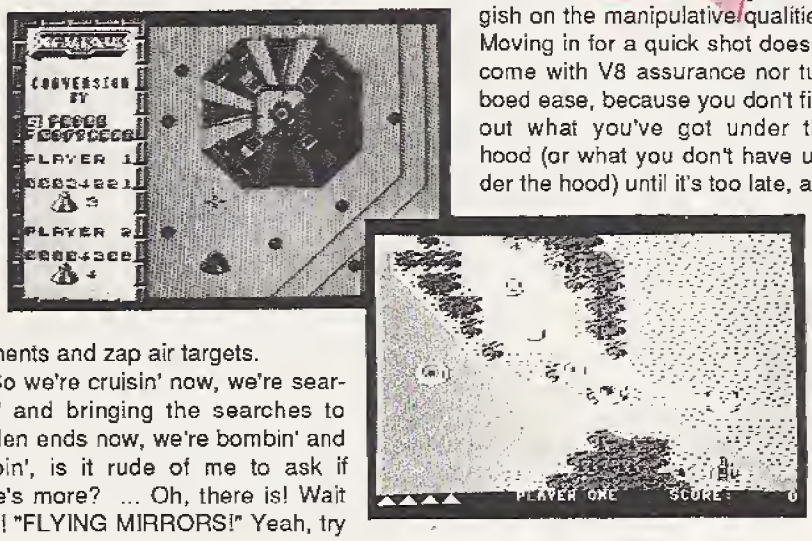
by J. Mark Hunter

WHY does everything have to happen "eons of time ago"? Tell me that.

Any, "many eons of time ago" an advanced technologically orientated civilization - the sheer creative impromptitude of this program just grips me! - was forced to evacuate the Earth prior to the Ice Age. ... Ahhh, you see, but they were warned, they just didn't listen. Their mothers *told* them to bring their thermal underwear and snow chains and you see what happened, they couldn't stay behind and play out there with the other advanced technologically orientated civilizations...

Now, these Xevious people, affectionately known as "Xeviates", are coming back! Yeah, returning to reclaim their heritage through conquest. They've got their underwear, they've got the chains, they've got the space ship anti-freeze. From the controls of your Solvalu super spacecraft you must defend the Earth from takeover by the Xevious invaders!

How ya gonna do that?! Just pray they touch down in Siberia in winter or Melbourne in summer. Fly a search and destroy mission, cruise over scrolling landscape, bomb Xevious ground establishments and zap air targets.



So we're cruisin' now, we're searchin' and bringing the searches to sudden ends now, we're bombin' and zappin', is it rude of me to ask if there's more? ... Oh, there is! Wait for it! "FLYING MIRRORS!" Yeah, try doing your make-up in one of those, babe! Flying mirrors, impossible to destroy, "a collision will spell certain death" (in twelve letters or less).

In the event of your surviving wave after wave of enemy onslaughts you will encounter the controlling force of the *Xevious* offensive - the Andor Genesis Mother Ship! This is your goal.

A direct hit to her central reactor will disable her, but don't be lulled into a false sense of security, you didn't hid the chip in the Ming vase that well. Xevious forces will soon reappear to renew their attacks with increased determination! One more exclamation mark - ! Oooh, and another ! I like it.

And after all this serious flippancy it kind of may come as a shock to all but I didn't think the game was that bad. In fact, move your eyes to the bottom of the review and have a scrute of the "Overall" figure - better than three quarters of the way towards perfection, excellence, 76.

Xevious on your homestead computer is a good implementation of the arcade game. And even though computer magazine writers love using the word "implementation" I jive you not. Good implementation, but it does get sluggish on the manipulative qualities. Moving in for a quick shot doesn't come with V8 assurance nor turboed ease, because you don't find out what you've got under the hood (or what you don't have under the hood) until it's too late, and the sound effects of the explosion turn out to be you...to be you...to be you...to be...

Graphics are feasible, some kind of lilypad green houndstooth pattern representing what we must take for alien vegetation - the actual craft not exactly streamlined supersonic either, but it has the ammo and the wherewithall to maintain a dignified front on the battlefield.

In relation to the arcade version as opposed to the one you've got flashing late, late movie patterns on your bedroom wall - the PC *Xevious* definitely lacks, not in everything, but you've got more of an edge to win when you had to insert $0.20...where am I?- 40 cents in some suburban shopping mall machine.

Music sounds like a cockroach gargling with eggnog and bugs you very, very soon.

According to my main man Farrell: frustration is a key doom factor. The explosion sequences just don't make it. Yet, yet, it's still quite stimulating, even though they haven't made it just that tough enough to quell the perturbable hours of your time with the same stealth as a Ludlum novel.

See you next month, or maybe tomorrow morning on the train. I take the 8:08 to Mars.

XEVIOUS

Publisher	Namco
Distrubutor	Melbourne House
Machines	C64, Amstrad
Price	C $29.95
	A $29.95
Graphics	74
Sound	76
Music	40
Presentation	81
Documentation	55
Overall	**76**

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FLYSPY

"LONG, long time ago...in a galaxy far, far away...something about warped geniuses, nasty professors, wreaking of vengeance, etc. Infiltration into the National Grid control system, power cuts country-wide, it's all here. And it, this guy, must be stopped.

Oh, sure. And how do we make this happen? Me, probably. Am I right? The player's got to do it? Certainly so. How? Got to get inside, inside the proverbial super-computer controlled by whats—his—face, the jerk, the real bad jerka-mundo.

They get you shrinking in size, micro-chip shoulder pads and assorted silicon underwear. Then you're riding a micro-chopper with the whirly-bird thing on top and hazard lights jammed on. Equipped with a small fuel tank and a special, limited-edition, customized shield unit. A suave runabout with standard equipment interface enabling you to attach to the chopper any equipment left lying about the place.

Inside this computer where no one else this side of Andrew Farrell has ever trekked are several teleports located at suitable intervals and you can use these to jump short distances and save youself a lot of time and fuel. Then there's matters about keys and teleport codes, standard computer-innard-crawl data you always get with these things.

The music is hardly inspirational. Sounds like a dying tulip actually, sounds like a hi-fi in a Fanta can.

Graphics are highlighted by the significantly good colour, but the sound effects replicate the playback on an answering service.

The chopper is fun and the arcade and alleys you zip your way through prove quite a saturation level of amusement and enjoyment. At least we're somewhere else on Earth having this adventure. Nothing more than a few feet off the ground, nowhere where Skylab could scratch our paintwork.

We're inside the computer! And the only war happening is on the outside, beyond the screen - where flies and spies deserve each other.

FLY SPY	
Publisher	Mastertronic
Distributor	ISD
Machines	C64
Price	$9.98
Graphics	78
Sound	55
Music	47
Presentation	48
Documentation	65
Overall	70

TRAP

Trap scenario ... Time — an age in which the ultimate deterrent may have become the ultimate destruction. Are we talking syphilis here, traffic fines and blimp joy rides?

The place: A distant corner of the galaxy where you can't find anything, where human life strains to exist in the void of space.

Setting: Brisbane. It's true. I mean it gets better than that in Soweto.

The mission: "Can a violent aggression and mindless destruction ever be justified in the name of peace?" This is the question we get asked on the cover of *Trap*.

Feeling kind of psychologically stimulated now, religiously tuned, I anwer to myself in as concise a soapbox debate as possible... no. I'm sure Gadaffi and Churchill feel and felt the same way.

They tell us about the "enigma" then. The trap in which you are to be placed in is one of energetically defending your planet, your people from a once peaceful ally.

This outer space adventure might just as well be about any war going down at 10:00 this morning, I mean, what kind of jive are they pumping here?

Or is it just one of those production department psyches that make you inclined to tune yourself to mock-heroism?

Whoa.

Your quest: To demonstrate the reactions and skills of a legendary space fighter or to show the genius of a master strategist...and then they say it's not enough. And now I agree, it's not enough — it has never been.

Three tests worked into the program.

1. Maneuvrability and reflexes in the flight through space mines.

2. Courage and intelligence in flight down Zarkab Valley. Zarkab Valley, where no cat lives alive. And we're meaning the cats... the cats are dead.

N.B. This game doesn't have a cat in it.

3. Determination and stealth. On foot in search of ORBS.

Test 1 and 2, have to be completed and all aliens dissipated into laser clouds before landing and proceeding on foot through test 3. The better you are the faster and more furious the challenge. Every successful mission is rewarded by upgrading your ranking and making the next in a higher rated spacecraft.

Clear? I hope you said no.

Hey, the graphics weren't either. As of this moment they still aren't. They remind me of cheap copy logo stickers for a B grade, low-rent part of town company. The sound effects based on what comes our of an Amstrad speaker adequately fit the sub-standard material arranged on the magnetic plastic. I'm not even sniffing a breeze of originality here and it's messing with my sinuses.

Don't get trapped into this game. I'm asking for a refund and spending my money on double live albums. You get it?

TRAP	
Publisher	Alligata Software
Machine	C64
Graphics	38
Sound	34
Music	27
Presentation	25
Documentation	25
Overall	23

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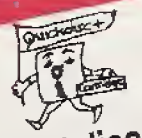

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Improved DOS commands (DOS 5.1) makes for easy use of the disk drive e.g. s(RETURN) will LOAD and display a directory without over-writing BASIC. SHIFT RUN/STOP will LOAD "0:*",8,1 etc. **Very, very useful.**

Incorporates Centronics printer software (user port) **with CBM graphics** capability (requires user port centronics cable).

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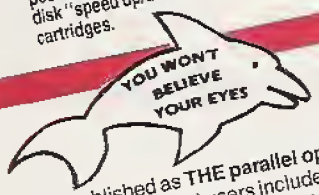

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THE EFFECT IS STAGGERING.

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(These figures do not allow for searching)

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STOP PRESS

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The Cartridge Expander extends the "GAME PORT" on the C64. Console by providing 3 additional cartridge "SLOTS" which will hold 3 of your favourite command modules.

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Uncle Pete's latest

Win a disk full of the latest demos

Hello everybody, this time Uncle Pete's got a crossword puzzle for you, written with the remarkable *Crossword Magic* from Mindscape. It's not an easy puzzle but crossword fans may expend few K's of memory over it.

As a matter of fact, the first correctly completed puzzle which I receive will win its sender a disk full of the latest demo's from Europe.

These feature amazing scrolling messages under, over and through the borders, outstanding music and vivid hi-res screens. They are the products of twisted-minded hackers throughout Europe, who are locked away in their bedrooms for four months of winter with only their 64's for company, and they download these masterpieces through the telephone system to anyone who cares to view them.

I view them as a totally new art-form, of which we are going to see and hear a lot more.

Send your puzzle or copy to ....
P.O. Box 4
West Wallsend,
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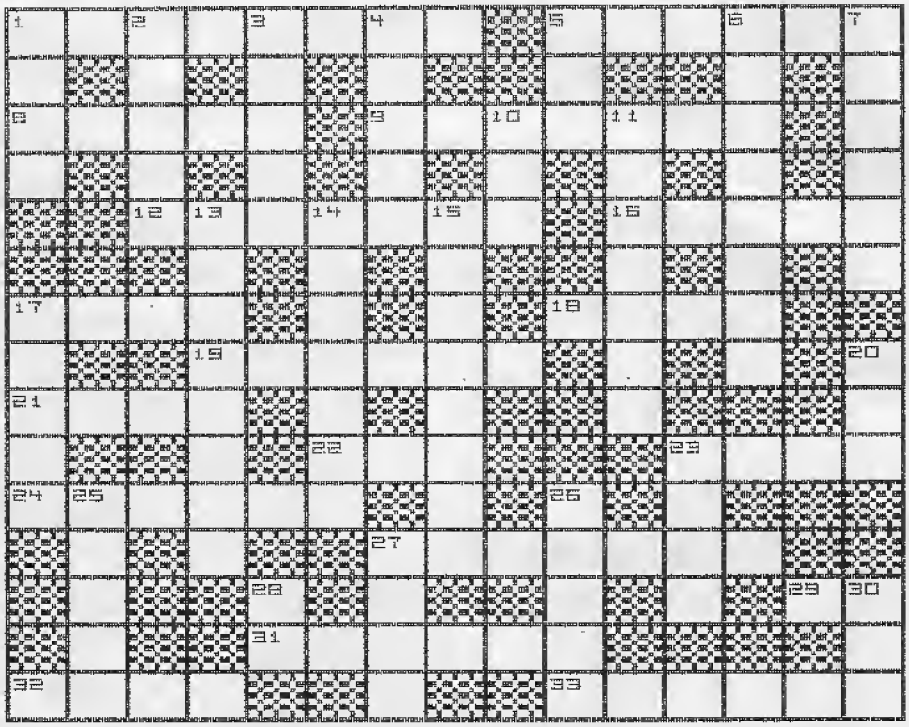


ACROSS CLUES

1. *Boulderdash* hero
5. .....Bovver
8. Keyboard code
9. Not in gear
12. Inputting software
16. Newcastle express train and old time pilot
17. No. of fingers
18. Music interface
19. Music style
21. Bread unit
22. Famous cube
23. To read a program
24. *Law Of The West* has one
27. Fixing errors
29. Where its ..
31. Eight legged
32. Eight bits
33. Common error

DOWN CLUES

1. Scan pages
2. Man's name
3. My Friend .... (TV show)
4. Famous Indian cricketer
5. Weather in summer
6. She-Demon
7. Come back
10. Caveman's name
11. Untrustworthy character
13. Too full error
14. Old time soldier
15. Early fast-loader
17. Storage system
20. Smallest computer unit
23. Having length
25. Yarra up for storage (anag)
26. In the sky
27. Out
28. We
30. Income...

Australian

Amiga Review

RAM Expansion

Hard Disk Comparison

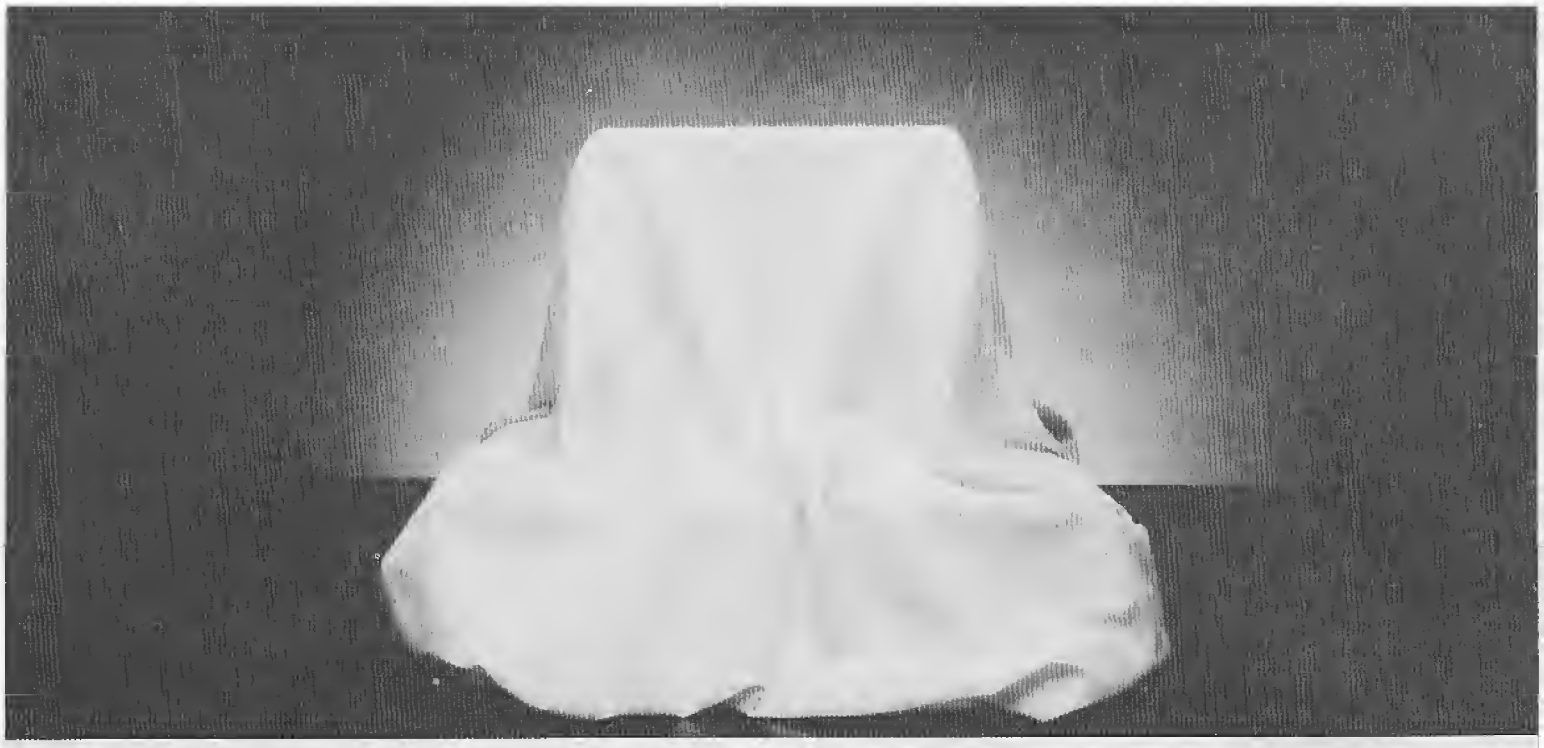
Telecomputing

Game Reviews:
*Starglider
*Barbarian

Using Fish Disks

Vol 1 No 2

Inserted In The Australian Commodore and Amiga Review



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Major

BUSINESS SOFTWARE

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- Multi-user Amiga*

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MAJOR Business Software is available for your Commodore Amiga 500, 1000 and 2000 with hard disk drive.

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CHARLIE'S

Next Month

★AMIGA 2000
—A full report on the most expandable of the Amiga range, including a look at the PC emulation mode.

★Entertainment software
—A complete roundup of what's around when it comes to having fun.

★Kurta Graphic Tablet
—Instead of a mouse, use a graphic tablet. Full review of one of the less expensive models.

★Letters
—Send in a query today so we can publish it soon, complete with answer of course.

★Amiga Talker
—A word processor that talks! How good is it? Staff writer, Mark Hunter, puts it through its paces.

★Coming Soon★

—Memory expansion. From several kilobytes to multiple megabytes. A full comparison test of all the options and choices.
—Are you a distributor of one of these devices? Contact the editor as soon as possible to be sure your product is included.

Editorial

Welcome to the second issue of *Australian Amiga Review.*

Your copy, if not inserted in the middle of *Australian Commodore Review,* was sent to you with the compliments of one of the following dealers:

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Australian Amiga Review is produced monthly, to provide users with a guide to specific products and applications.

If you have any questions you would like answered, or topics you think we should write about, please don't hesitate to contact us by mail.

Contributors are also welcomed. At the moment we have limited space available, but we fit in as much editorial as possible in every issue.

The Amiga has managed to establish itself as a market leader in Australia. With three models to choose from, all offering vast potential, the future looks exciting.

At the moment we are testing out the new Amiga 2000, with bridge board and expansion memory. It looks to be the ultimate choice in home computers. You can have the power of Amiga's graphics, sound and multi tasking capabilities as well as the flexibility of PC compatibility. Full report next month.

Until then, remember not to pull the disk out until the light goes off.

Andrew Farrell

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Contents

Amiga hard-drive alternatives

by Andrew Farrell

Once you've been treated to the delights of hard disk power, you'll never think in terms of floppies again. This month we take a closer look at what's available.

Four units graced the stage for a line up of the meanest, toughest, collection of drives you've ever seen. All look like they're built to take it. Strong metal casing with chunky rubber feet give sturdy look and feel.

Of course, hard disks are inherently fragile and best treated with the utmost care and respect.

Connections:

All but one of our test drives connected via some form of controller or interface to the bus expansion port. The Multisoft Fast Drive 100 is unique in that it plugs directly into the parallel printer port.

Disk mechanisms used are standard, readily available and serviceable units. Usually the controller used conforms to the SCSI (Small Computer System Interface - pronounced "scuzzy") standard. Abiding by this standard is one way of ensuring future compatibility, as the SCSI way is likely to become increasingly popular.

If you already have a device connected to the bus expansion, such as a RAM expander, you'll connect the disk controller or adaptor to the bus pass-through.

Failing that, connect the disk interface first, and your original device second. Try not to get caught with two non-pass through expansion devices. A few of the earlier Amigas had some problems supporting two devices on the expansion bus. Although unlikely, contact Commodore if you should discover this problem.

The Fast Drive 100, although connecting to the parallel printer port, allows up to seven drives to be daisy chained, as well as having a printer connected.

Performance:

Everyon wants the best for the least possible. When it comes to performance, a small tradeoff in price may not be worth the drop in speed. No single test is really conclusive, as close examination of our results will show. Some drives excel in one area, but fall way behind in others.

Our results were generated using a program that is commonly available in the public domain on Fish Disk number 48. The program performs a series of tests, from writing and reading blocks of data, to multiple file creations and deletions, and directory scans.

Files are then written to the disk in four different sizes from 512 bytes, to 32K, several times. Each file is then read several times and a speed in bytes per second calculated for each function.

No drive is exceptionally fast in every activity. Some show a marked edge over the rest. However, on the whole all perform well. Any hard disk is a welcome relief over the slowness of the Amiga's floppy disk system. Unfortunately, the improvement is not dramatic, with an increased speed factor of only around 3-5 times. This is still way below what some users may have anticipated.

In the future we may well see an increased difference in the speed of hard disk systems. As DMA development progresses and tighter disk handling routines are written, a further increase by a factor of ten may well be possible.

Rumors also abound of a possible release by Commodore of an improved disk I/O system. AmigaDOS is inherently slow at present, but operation may be improved with the use of extra memory. Use the ADDBUFFERS command from a CLI to increase the size of the capture area for the last accessed file.

Conclusions:

If you're after a quick and simple solution to disk storage, you'll probably end up buying the Multisoft Fast Drive 100. It is readily available and will work on the entire Amiga range including the Amiga 500 and 2000. However, keeping future developments in mind, it would be wise to take a close look at Expansion Systems hard drive. It's the more pricey of the bunch, but by far the fastest. A cheaper alternative is the C Ltd, which combines good performance with a relatively low price. At present Expansion Systems only have available the 20Meg version of their drive. However, we tested the 80Meg version which uses a Voicecall drive mechanism, the test results of which are those in the included table 1.

Multi-Soft will be releasing an 80 and 40 megabyte version of their drive in the near future. ACME Software are also expecting a new drive in coming months, so stay tuned for further details.

Fast Drive 100
Multisoft
1133 Hat St, West Perth
Phone: (09) 322 6637

C Ltd Hard Drive
ACME Software
PO Box 3, Brighton North
Vic 3186
Phone: (03) 596 6732

H-HD/X-1000
Expansion Systems
111 Palmer St
Woolloomooloo, NSW 2011
Phone: (02) 356 3445

Table 1.
Fish Disk Tests
Written By Rick Spanbauer.
File read and write measurements are in bytes per second.

Device	DF1:	RAM:	C Ltd.	Fast Drive	Expan. Systems
File Creations	0.1	5	6	7	6
File Deletions	1	10	10	15	15
Directory Scan	36	5	51	39	51
Seek / Read	17	51	55	33	53
Read 512 bytes	11702	201469	28807	15791	26214
Write 512 bytes	4818	131072	12977	9295	13443
Read 4096 bytes	12365	655360	34952	18591	19134
Write 4096 bytes	4974	262144	17712	9602	13512
Read 8192 bytes	12423	873813	34952	18724	22405
Write 8192 bytes	4955	262144	17712	9637	13512
Read 32768 bytes	12483	873813	34952	18995	23405
Write 32768 bytes	4964	291271	18078	9673	13512

Table 2.

Product	Cost	Capacity	Adaptor Price	Pass Thru	DMA Access	Cooling Fan
Fast Drive 100	$1995	20Meg	n/a	yes	no	no
C Ltd. Hard Drive	$1895	20Meg	Included	yes	no	no
	$2900	40Meg				
X-HD	$1795	20Meg	$1395!!	no	yes	yes
	$2800	80Meg	$1395!!			

!! X-1000 Multi-Function Board includes battery backed clock/calender, 512K FAST RAM, SCSI interface.

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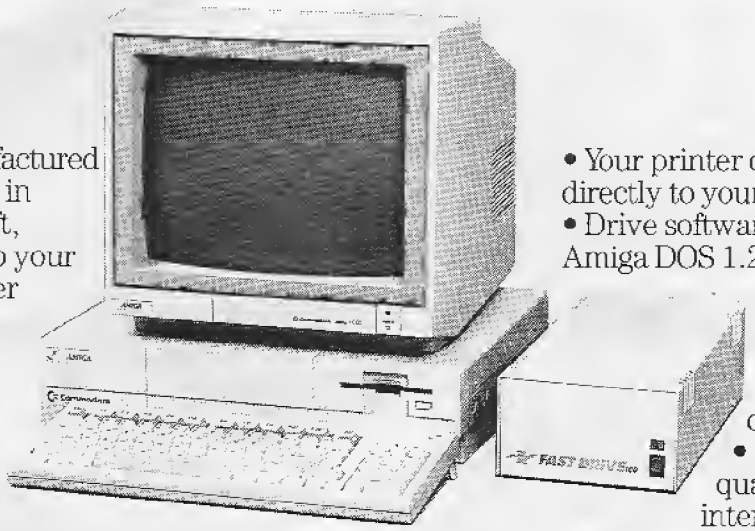
Now with Fastdrive 100, you get 20Mb to 40Mb hard disk versatility for Amiga 500, 1000, and 2000 in a single, compact unit.



Designed, manufactured and supported in Australia by Multisoft, Fastdrive 100 links to your Amiga parallel printer port via a 25 pin shielded cable. This leaves the expansion port free for additional memory to be added.

Exclusive Multisoft interface electronics combined with hard disk storage drives from leading manufacturers ensure Fastdrive 100 is not only fast, but reliable.

Put these features together with local backup and Fastdrive 100 represents a breakthrough in mass storage for the Amiga owner.

ADDITIONAL FASTDRIVE 100 FEATURES.

- The vented steel case and power supply are designed to create convection cooling for the drive mechanism, which alleviates the need for cooling fans, and results in extremely quiet, low maintenance system operation.
- Up to seven Fastdrive 100 units can be daisy chained together.
- Your printer can be connected directly to your Fastdrive 100.
- Drive software runs under Amiga DOS 1.2 and easy start up and diagnostic utilities are included to verify and test for correct operation.
- 36 watt high quality reliable internal supply.

Put these features in a colour co-ordinated steelcase designed to match the Amiga unit and you have the revolutionary Fastdrive 100.

See Fastdrive 100 at your Amiga dealer now. Another quality product from Multisoft.

FAST DRIVE 100

Multisoft

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CHARLIE'S0508

Two Megabyte RAM Expansion

It is a welcome change to be able to review a locally produced product which holds its own against the imported variety - "import substitution" as Mr Keating would have it, and let's hope there's a lot more of it, if only for the improved prices.

Proton Microelectronics is the company responsible, based in Adelaide. Their range of RAM expansion boards includes 512K, 1024K and 2048K versions. The one I have tested is the 2 Meg (or 2048K) and it is a Non-autoconfigure board - I am assured by Proton that their Autoconfigure versions (for 1.2 software only) will be available by mid- to late August, for $95 extra on the prices they are currently charging. Proton also assures me that the boards are compatible with Sidecar (not having a Sidecar, I couldn't test it), and that the boards are designed to chew up little power due to their "Low Power CMOS Design", thus allowing 4 of their 2 Meg boards to be added to the side expansion port of the Amiga, giving a remarkable 8 Meg and more!

Having had the extra 2 Meg available for the last couple of weeks, it seems hard to imagine finding a use for so much RAM . . . then again, it is remarkable how memory demands rise to meet availability.

Installing the unit was a simple matter of pushing it into the side expansion port (with power off); copying the two commands ADDMEM and MEMINSTALL into the C directory of the boot disk, and adding the command MEMINSTALL in the startup-sequence in the S directory. Booting up then shows a message saying "some expansion memory found" and it's all available for use. If you happen to have a Sidecar, your startup-sequence will say Meminstall -Sidecar, and if you've had the "Kickstart in ROM" upgrade done, you'll type in - kickram as well. The board also comes with an optional clock, worth getting so that you can forever forget entering the time and date. Note that all the above will be unnecessary if you buy the Autoconfiguring version - the 1.2 software will handle it all for you.

The appearance of the unit is neat and pretty compact - it is beige-coloured, practically the same as the Amiga, and when sitting in the port rises about 3 cm above the CPU, and extends from behind the joystick port to the back of the CPU. It's housed in a metallic casing, and of course has a Pass-Through Bus connecting up more units.

> "Australian products of good quality and very competitive pricing"

An inspection of the innards of the board by a friend who is a computer engineer revealed solid workmanship in the construction. The documentation which comes with the board, both on paper and on a disk was quite sufficient to understand what to do with the thing. Another option provided is an Analogue to Digital converter for those involved in more technical pursuits, and a six month warranty is also provided.

So those are the facts, but is it worth getting? And how does it work in practice? The best use for such a board, in my opinion, is for setting up a "Recoverable RAM Disk" (RRD). The great virtue of such a device is, as its name implies, that if the computer hangs, or you get a Guru, you can reboot with the same boot disk and everything that you had in RAM is still sitting there, blithely unaware of any crash. This makes you feel warm and secure, since you can use the speed of RAM without its transience. So, for example, I load my full customised Workbench into RAM (or the virtual device VDO:, to be precise), remove the actual disk and carry on as before with much greater speed, and with a disk drive freed up. And since the total RAM of the system comes to over 2.5 Meg, there is still about 1.6 Meg available for other uses.

A company called ASDG in the US has made available such a RRD on Fish Disk 58 as shareware, and it works very nicely with the Proton board. Such a set-up would also work with the 1 Meg board with room to spare, and if you got the half-Meg board you would probably make a slimmed down RRD with just the basic commands and libraries.

As noted in the documentation, there are some programs which don't run with Expansion RAM, notably *Deluxe Paint I*, which uses "Chip" memory (your original 512K of RAM) exclusively. Most programs are fully compatible with expansion RAM however and will look for it and use it if it's there.

I noticed that a couple of little utilities had problems, for example the "ChangeKickStart" utility, which allows you to change your Kickstart disk over without turning off the computer. On the other hand, I loaded the entire *PageSetter* program into RAM and found that performance was much improved, especially the speed of refreshing or changing of the display.

All in all, considering the facts that these are Australian products of good quality and very competitive pricing, and that the addition of more RAM makesyour Amiga purr with pleasure and speed, I would recommend these boards highly. If you want a little more ease of installation, wait perhaps for the Autoconfiguring versions. But if you're finding that you're beginning to reach the limits of your 512K fairly regularly, consider such a purchase. The Amiga was made for it, especially since it's a multi-tasking machine, and you'll find quite a leap in performance.

Of course, my problem is that now that I've tried it for review purposes, I can't do without it, and I'll have to fork out and buy it.

Source:
Proton MicroElectronics P/L
Tel: (08) 277 0323
Products:
512K RAM board $470
1024 K RAM board $590
2048 K RAM board $980
Clock $95 extra
Autoconfigure extra.
Availability:
Some dealers

□

Telecomputing

by Tim Strachan

With the huge number of communications protocols, baud rates, brands of modems and computers and claims made by advertisers, the beginner can feel very confused.

All he wants to do is get onto a bulletin board or a database. I'll try to clear up a little of that confusion here, and review a couple of packages which should help.

Overview: Modems are needed to communicate with your computer over the phone lines, simply because computers emit digital pulses (bits and bytes in bursts) while phone lines transmit in the form of a frequency. This will change as voice telephone networks slowly change to digital transmission, when it should be possible to connect a computer directly into the network - but not yet.

Mod/Demod: Keeping it simple, modems take the digital output of a computer and change these signals into an audio frequency, a process known as Modulation. The reverse process, going the other way, is called Demodulation, hence the name Modem. You can get internal, external or cellular modems. To date, for the Amiga, stand-alone external modems are available, and it is possible to get an acoustic coupler, a simpler type of modem which is a linked pair of insulated acoustic sockets that you push your handset into These are fairly rare these days as modem technology speeds along.

Smart & dumb: As modems go,there are "dumb" modems and "smart" modems. A dumb one requires that you do everything tor it, and will probably handle just

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The Bit Blitzer 12E

Things have changed a bit in Modemland, in terms of bothquality and cost, and the Bit Blitzer 12E is a very good example of the changes.

The modem itself is a well-packaged, neat unit with a footprint a little smaller than an external disk drive, and less than half the height, and it packs a lot in. Features included:

- V22 (1200 bps) and V21 (300 bps) : CCITT standard, ie, Oz
- Bell 212A (1200) and 103 (300) : US standard
- Full duplex, ie simultaneous data transmission and reception over a single telephone network connection
- Auto-dial and Auto-answer and Auto-disconnect
- Tone and pulse dialling (which is automatically detected)
- Hayes AT Command Protocol
- Call progress monitoring (ie, tells you if anything goes wrong)
- Loopback for remote diagnostics
- Internal speaker with manual and software volume control
- 8 status and activity indicators (LEDs)

This list of features is pretty impressive at a price of $349 RRP, and everything does work. No cable is provided with the modem, so you may have to go to a dealer and specify an RS-232 cable with two D25 male plugs.

The documentation consists of a well-written spiral-bound book which, while it's not a communications text book, is sufficiently detailed to let a beginner test and install the modem. It is well set out with an Overview section followed by a step-by-step procedure for installation.

At the back of the manual are some other useful sections: Troubleshooting, to let you solve any problem that may occur; Country Specific Information, including a section on Australian conditions; an Appendix with details about the Serial Cable; Appendices on Hayes Command Summaries; and a listing of the ASCII Character codes.

Having followed the Installation procedure, it is possible to change any of the 10 Configuration Switches on the bottom of the modem. These are set at the factory in a way which works with the Amiga with no changes.

Some of these options are "hard" and some "soft", ie, the soft ones can be changed by commands. There is also a Reset command to change all configurations back to the actual switch settings. In other words, you can fine tune the modem as much as you like, using both hardware and software. Once you've set things up for normal use, you'll probably never change them.

I've tried the modem with a number of Communications Programs, including *Diga!*, an excellent and powerful program by Aegis; *Vt 100*, another powerful Public Domain program, and a number of others, and have had no problems in getting onto bulletin boards, uploading and downloading files, or even using the"Remote" and "Doubletalk" options available in Diga! (Doubletalk lets you transfer files to another *Diga!* user while chatting, and Remote allows you to use your Amiga as a kind of BBS, which others can connect up with to use your Amiga at a distance - both very useful.

I'm told by the supplier of the Bit Blitzer that it is possible to get the same modem with Viatel compatibility for about $495, a desirable option for some. This will be available towards the end of August. There will also be a 2400 baud modem available in the future, but there are no firm dates

---

Telecomputing continued

one speed or protocol, and is fine if you have specific needs covered by its capabilities - an acoustic coupler is an example of a dumb modem.

Smart modems have some fancy frills, such as doing things like calling and answering automatically, and are faster, easier to use and have a bit more style. Some may monitor the signal level and take action to compensate for fading lines, or suspend communications if the line is suspect. A really smart modem can choose between tone or pulse dialling or even mix the two for dialling overseas from a pulse-dial PABX, and it will have an error checking system to put intelligible messages up on the screen if there are problems.

The standard by which modems are judged is the Hayes standard, developed as a result of intelligent design and good marketing. There is a set of commands devised by Hayes, each of which begins with the prefix AT, hence you'll often see an ad for a modem claiming "Hayes compatibility" or AT compatibility".

Bauds and bps: Modem speeds are measured in "bauds", which is essentially the same as "bits per second" or bps. When a computer sends a character out through the serial port, it uses the conventional ASCII code of 8 bits for each character or byte, to which are added a "start" bit (to say that a character is coming) and a "stop" bit (to indicate the end of that character byte). There are variations on this, but that's the basic idea.

So a 300 bps transmission translates to about 30 characters/sec (say about 5 words), thus taking about a minute to transmit a full A4 page of characters. So from the point of view of saving time on the phone lines, 1200 bps will be more economical.

A smart modem will have a selection of baud rates, and if it's really smart will be able to detect the rate of an incoming call and set itself to match.

Telecom's Viatel service uses 1200/75 bps: the host Viatel computer downloads to you at 1200 bps, while you communicate with it at 75, about the speed of a fast typist. If you're interested in Viatel, you'll need a modem and corresponding software to handle these rates. There are Viatel packages for the Amiga: *SuperTex* in the Public Domain, for example.

Sync/Async: Below 2400 bps, asynchronous communications is used - ie, there is no overall timing control of the communications system. High speed modems are usually synchronous, ie, a crystal-clock timing system keeps both ends in sync to help preserve data integrity. If you want to get really flash, and have a dedicated line, you can move into speeds of 9600 bps and up. At present, however, the upper limit for personal computers is 2400, and that is rare still.

Standards & protocols: CCITT, an agency of the International Telecommunications Union, has set speed standards, giving each method the letter V prefix. The common ones are:

V21 - mostly used for bulletin boards, 300 bps each way.

V22 - 1200 bps each way.

V22 bis - doubles the speed of V22 to 2400.

V 23 transmits at 1200 bps, receives at 75 (Videotex services)

Naturally, the Americans have their own set of standards called Bell standards, requiring a form of analogue modulation, and incompatible with our standards (just as they have NTSC video signals while we have PAL). Note that it's unnecessary to buy a modem that claims to adhere also to Bell standards - if you're going to call the US, OTC's MIDAS overseas packet-switching network will handle it using the normal CCITT standards

RS232: About the nearest thing to a universal standard, but with a lot of unstandardised aspects. The RS-232 port on the back of your Amiga can feed (serially, rather than in parallel) your serial printer or modem or numerous other peripherals. The actual physical standard of the connector itself has developed into use of the 25-pin connector known as DB-25. Not all these pins will be connected, and you may find as few as three, or up to 10 or so.

The Amiga has a female port, and you may find you need a "gender-bender" if your modem's cable is the wrong sex. Also read carefully the manual for which pins should or should not be connected. For the enthusiast, investment in a "break-out" box will let you cross-wire plugs at will. The average user should make sure that the modem bought comes with the right cabling - demand it from your dealer. □

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Using the Fish disks

The Fish Disks are a wonderful resource for any serious user of Amigas, and Fred Fish should be congratulated for the sterling effort he has made to bring the wide world of Public Domain software and Shareware to all Amiga users, maniacal and moderate, beginners and veterans.

While all the information is there, however, it's not always easy for the average user to access it, due to the fact that use of the CLI (Command Line Interface) is usually required. Fred hasn't opted for a Workbench set-up, except when the programs arrived with icons already set up. So here we'll explain the few necessary procedures for having a good browse of any such disk that comes your way, and it's worth knowing for both fun and learning.

Method: First, it has to be stated that if you don't have an external disk drive you are seriously handicapped for many operations on your Amiga, apart from this one. It is strongly recommended that you get one, for your own sake.

However, if you persist in this madness, you will need to load various CLI commands into RAM - see the article in Megadisc 2 for details on doing this, and in the following discussion, when reference is made to **df1:** (the external drive), any single drive user should replace it with **df0:** , having loaded RUN, CD, COPY, TYPE, DIR and LIST to RAM.

So you've got your Workbench in df0: and FISHx in df1: . Those with one drive have the Workbench in it.

● To get into the CLI - Double-click on Preferences, and click on the CLI ON in the screen you'll see. Click on SAVE, and now open the SYSTEM drawer, and double-click on the CLI icon. You're now presented with a CLI window with a little 1> at top left. This is your PROMPT and is where you'll see the result of whatever you type, ie, CLI commands.

[Single drivers now need to copy the above commands to RAM, by entering
> copy c/run to ram:
> copy c/cd to ram:
etc for each command. Now when you see any of those commands mentioned below, add RAM: before each one. Soi nstead of entering ***> dir*** *you should enter*
> ram:dir *and your first command, once you've inserted the Fish disk, should be* ***>ram:cd df0:*** *which tells the computer to use the CD (change directory) command from RAM, to change the directory to the disk currently in drive df0:]*

● First you'll want to see a general Directory listing, so enter
> dir [return]
and you'll see the contents of the ROOT directory of your Workbench disc. To do the same for the Fish disk, enter **> dir df1:**
To get a full directory listing on everything on the disk, including the contents of the SUB-DIRECTORIES (those with (dir) after them), enter
> dir df1: opt a [return]
and you'll see it all scroll past, fairly fast. To pause the scrolling at any time, hit the space bar. To continue scrolling, hit any key, such as RETURN. Now you know what's on the disk, at least by name.

● Further delving - Fred Fish always puts a file on his disks which explains briefly what the various programs are about, and you'll see it at the bottom of the directory listing somewhere in the form of README.listxx where "xx" is the number of the disk. To read this, enter
> type readme.list36 [return]
or whatever number it is. You'll see it all scroll past, so press the space bar to stop it if required. You might want to print this list for easy reference, so turn your printer on with your Preference settings as you want them, and enter
> type readme.list31 to prt:
and you should see it appear on your printer.

● Now you'd like to see more, and it may be that you have got Fish 36 and you're interested in the "YaBoing" program in the "YaBoing" directory. You want a closer look, so to change your drectory, enter
> cd df1:Yaboing
and you'll presented with the prompt again. To see what's actually in the directory, enter **> dir**
and you'd see
POSTER YaBoing
YaBoing.c
Before running the program, you'll probably want to see if there are any instructions on how to do so, anything that might have to be done first, or whatever. So enter
> type poster
and you can read the contents of this text file, which is probably a message from the author when he uploaded the program to a BBS in the States, and might have some bad-taste jokes, or useful information or even a plea to users to support his efforts by sending in $10. After you've written out the cheque, you'll want to see what this thing is, so you enter
> yaboing since that is the "executable" program, ie, the one that actually does its stuff. The Yaboing.c is probably the "source" file, ie, the listing of the program in the C language, and probably beyond you right now, if you're reading this. By now, you should have seen a little "title bar" appear in your screen, so click on it and you should see a cascade of balls all over the screen. (You could have entered **> run Yaboing** at the previous prompt, to use the multi-tasking abilities of the Amiga, and to avoid a software error, as happens very occasionally with the PD programs.)

● You've had your fun with Yaboing, and want to check out some of the other directories, so enter
> cd : or **> cd /**
the first of which takes you back to the root directory of the disk you're on, the second taking you back "up" the directory tree one level - in this case, since you're only one level down, they both do the same thing. Now you can carry on doing the same sort of procedure with the other directories on the disk. Simple, eh?

● A final note about Suffixes - just as Yaboing.c indicates a C source file, and POSTER a short note by the author, anything with a ".doc" suffix means, yes, a document, ".bas" a program in Basic, ".fnf" is a little note from Fred Fish, ".exe" an executable program (ie, just enter its name to run it, though most executable programs are a name with no suffix at all), and so forth. And the accompanying documents should be read first, because the program may need "Arguments", ie, further keyboard inputs after the name of the program, telling it something it needs to know, just as you entered > type readme.list31, rather than simply "type". And while the PD programs are generally fairly reliable, you may find that occasionally, for some reason or other, the system will "hang" due to a software error or some such. Put it down to experience, and boot up again, and treat that program with some caution.

With this as a start, you can now use the CLI to investigate any disk, and it often repays investigation since there are frequently useful little things hidden in the directories which are invisible on the Workbench, simply because no icon has been attached to them. This is easily done by using the Icon Editor - see the article on Megadisc 2 for an explanation of how to attach icons to anything.

DOSHELPER on Megadisc 1 is a very useful little utility for anyone learning about the CLI (it brings up information on screen for any of the CLI Commands), and you'll probably find some of the CLI articles in Megadisc of use as well.

Have fun fishing . . . □

Bit Blitzer 12E *continued*

of release yet.

In conclusion, I liked the modem so much I bought it. Had to have it. Considering the fact that it has all the features of Smart modems of much higher cost, is well documented, has a very small footprint, and only costs $349, I can recommend it as a high quality product of very good value for money.

Combine this modem with a powerful software package like *Diga!* and your communications will be a real pleasure, and not as costly as you might expect.

Name: Bit Blitzer 12E
Price: $349 RRP
Manufacturer: Banksia Information Technology Ltd, 201 Hollywood Commercial House, 3 Old Bailey St, Hong Kong.
Supplier: Mike Boorne Electronics, Eel: (02) 46 3014, (09 306 2056. Dick Smith Electronics. Some dealers. □

Amiga at work

PHASAR

by Ian Preston

If you want to start an Amiga owner off, the best question to ask him (her) is - what is it good for?

People who don't have a computer in the home often ask this question, especially if it's a new model (or name) computer. If you owned an IBM (or clone), people would assume you used it for business or home accounting; if it was a Commodore 64, their natural reaction would be "a games machine". (Although the C64 has far more uses than that). After Apple's recent advertising campaign, they would assume you used your Mac for bench top publishing.

Most Amiga owners would boast that the machine can do anything; faster and better than any other in the price range. Obviously a computer is largely restricted by software availability. So far the software manufacturers have concentrated on the Amiga's power in the sound and graphics areas. There's enough music and drawing software around to satisfy any amateur McCartney or Picasso. The games players are swooning over the snappy effects, but one (significant) area has been sadly ignored - small business and home accounting; and let's face it, any 68000 based computer with 512K of RAM and floppy drives of nearly a Meg each, should make a great business/home accounting machine.

There's a couple of quite reasonable word processors around. Nothing flashy, but soon to be released packages such as *Vizawrite* look very good.

There's been a glut of databases, but none to satisfy a home management environment, let alone a small business. Hopefully this situation is soon to be remedied by the long awaited *Acquisition* from CBM.

Several spreadsheets have been released, but most are hungry for memory and the standard A1000 is hard pressed to do them justice. Besides, the average home computer user has a tendency to shy away from spreadsheets. The burden of setting one up doesn't justify the end product. The average PC user wants a straightforward, simple, small business/home "number cruncher".

When the editor asked if I was interested in trying out a new small business/home accounting package for the Amiga, I grabbed at the chance.

First impressions of *PHASAR* (Programmed Home Accounting System And Register) were good. The software is nicely presented in a ringbound plastic binder that not only protects the manual but sits well on the shelf. (I hate spending 10 minutes digging for a reference manual to look up a 10 second problem).

> "The average PC user wants a simple small business/home number cruncher"

I groaned at the sight of the first page though. *PHASAR* proudly announced that it ran on IBM PC, XT, AT and compatibles, Commodore Amiga and Atari ST. I immediately assumed the worst; that *PHASAR* was yet another piece of software ported from another operating system, limited by that system and not taking advantage of the Amiga's power.

Certainly the manual is written to cover all systems. The concept of menus did not include the "pull-down" style of the Amiga. Another disconcerting statement in the manual was: *"Most of this manual was written by, and all of it was reviewed by, a total computer 'illiterate'."*

The manufacturer seemed to think this would make the manual more usable for us slow learners; I compared it to reading a motor mechanics manual written by someone with no knowledge of engines!

SPECIFICATIONS:

Remembering the old adage "You can't tell a program by its manual", I went to the system's specifications. Here's a brief rundown: *PHASAR* allows up to 39 accounts, 29 income categories and 97 expense categories. Miscellaneous income and expense categories and a cash account are automatically defined. Transfers may be made between accounts. The maximum number of transactions permitted for any month is 500. Up to 17 sets containing 20 standard transactions may be predefined. A data disk is intended to hold one year's worth of data. At the end of the year, *PHASAR* will carry over all unconfirmed transactions to the new data disk.

> "Data entry was easy and quick"

The manual is divided into two main sections (other than the intro and index): Tutorial and Reference. The tutorial is based on a fictional husband and wife team who as well as being a motor mechanic and nurse respectively, also run a chicken farm. The concept of having Egbert and Eloise running Egbert's Egg Farm, although humorous, tends to add confusion to a tutorial that at best, can be described as adequate. After spending some time reading the tutorial, the eggs were beginning to scramble; I decided to try the "hands on" approach.

An important plus for *PHASAR* is - no copy protection. The program can be Workbench copied and can be installed on hard drive. There is no Workbench on the *PHASAR* disk and it is not autobooting. The manufacturer recommends that on drives of 800K plus, the program disk is also used as the data disk; that's fine, but there's insufficient room for the Workbench as well. If you aren't running an external drive on your Amiga, it's the old problem - swap the disk every time you need a printer driver etc. On a two drive system, all is well, Workbench in DF0, *PHASAR* in DF1.

PHASAR loads by the standard double click on the Icon. Once you're in, that's it. No window or screen gadgets, no multitasking.

GOOD POINTS:

Yes, the manufacturer had gone to the trouble of incorporating pull down menus. Once into the program, the HELP key offered help and the ESC key gets you back to the title screen. As well as operating the pull down menus, the mouse can be used in the actual input of data. The right mouse button pulls up an options screen that relates to the area of the program you are currently using, and the left mouse button doubles as the return key. Moving the mouse places the cursor over the area you wish to work on. All mouse functions are also available on the keyboard.

PHASAR also uses a nice default system. Once the date has been set (it is first read from the Workbench value; if you're like me, that is rarely accurate), the last used date is offered as a default each time a transaction is entered. Cheque numbers are automatically incremented by the software and the next sequential number offered as a default. The account in use is also offered as a default. All in all, data entry is extremely straightforward. Entry errors (no one's perfect) are easily corrected.

I found the program was so well structured that the tutorial tended to hinder rather than help. The index and the Reference section were enough to get me out of trouble. The tutorial was worth a browse but I wouldn't worry if some of it doesn't sink in.

I used the AAUA ledgers as a test case. The transactions for Aug to Nov 86 (incl) were entered (roughly 160 transactions with a turnover of $9000). We only use one account (cheque) and the ledger is divided into six income and nine expense categories.

> "It reconstructed the data files with no loss"

As indicated earlier, the data entry was easy and quick. The 160 entries took a little over an hour (and I'm no speed typist). Entry of the various categories is simplified as each may be abbreviated to the first two letters (eg library is entered as li). After bashing the keys for an hour I decided to see what *PHASAR* had to offer.

Using the options from the "Transactions" menu, you may view/edit all transactions; viewing includes output to printer. This menu also offers the "Confirm with statement" option, designed to allow the user to compare the transactions with a bank statement.

The "Reports" menu offers view/print account and category summaries. The account summary is basically the balance of each account, the category summary is quite a good breakdown of income/expenditure by month. The "Analyse" menu contains budget and loan utilities and the final menu is "Setup" which allows the defining of drive paths and printer driver specifications.

Continued on page 16

Congratulations - Sydney United Computers

Sydney United Computers are changing their image. Gone are the sales staff in multi coloured jumpers, ties and shirts. Soon you'll be seeing a 'new' Sydney United. In line with their continual evaluation of the market, they have decided that a more professional approach is needed. So changes are being made.

The administration staff, already displaying their new dress code, feel that it makes for a more professional feel, with the added bonus of making life much easier not having tto decide each morning which clothes to wear. Added to that, they feel they no longer have to worry about getting biro or other stains on their good clothing. Instead they can still look smart in the clothing subsidised by Sydney United Computers.

The sales staff are also eagerly awaiting their outfits. They are to wear blazers with grey trousers, white shirts and black shoes. Once again this they feel will add to the professional image they are so eager to display.

Expansion

With the influx of Amiga software these days, Sydney United Computers have found it necessary to expand. As they cannot physically expand the stores, they are refurbishing them so as to be able to stock more software. They have at this time over 250 software titles for the Amiga alone.

Commodore IBM PC compatible packages

Due to the success of the new PC5 IBM Clone, Sydney United Computers have decided to put together a package including:

Commodore PC5,
Commodore Green Screen
Able-1 Software
30 MB Hard Disk
Sidekick Software

They will offer it as a complete package only, for a special price.

Achievements

Sydney United Computers staff have achieved quite a few goals over the past few months. In line with Commodore Business Machines sales incentive schemes, Shane Drew has won for himself one of the top prizes being offersd. The top of the line VCR by National will find a welcome home, Shane says, as his old one is showing its age.

Phil Lowe, manager of the Dee Why store, has also benefited from a free gift. Imagineering's latest sales incentive scheme has paid dividends for Phil, who has won a trip to Jupiter Casino for four days, all expenses paid.

And last, but not least, Keey and Mary Drew have benefited from yet another sales incentive by Sydney radio station 2CH, and received a free trip to Singapore for two weeks.

Not a bad month at all for the staff at Sydney United Computers.

What's new

The new X1000 Amiga SCSI interface with battery/clock and an extra 512K is finally here. A 20 and 80 MB hard disk is also available for delivery anywhere in Australia.

Sydney United Computers also stock the 20 MB Fast Drive 100 from Multisoft. You should make any enquiries to Bob Drew.

Having trouble keeping backups? Sydney United Computers are now stockists for the revolutionary backup system that saves computer files on A4 paper! Confused? Call in to have a look. Systems available for the Amiga, IBM PC Compatible and Commodore 64/128 computers. Have a file that you have saved on the Amiga and want to read it into your PC? This is one of the many features available to you. Come in today. Available at our City store, 207 Clarence St, Sydney.

Desktop Publishing - the High Tech way

Want to really see your Amiga fly? Then drop in to High Technology Computer Systems, Melbourne's own Amiga Centre. High Tech has just received a shipment of C-Ltd Hard Drives. These units plug onto the bus of your Amiga, and offer dramatic increases in speed, at a reasonable cost.

For a long time the Mac has dominated the Desktop Publishing market. More recently IBM PC compatibles have been making themselves felt, especially with *Ventura*. *Ventura* is the top quality desktop publishing program from Xerox.

Enter Amiga - well, the Amiga is a late starter in the desktop publishing stakes (especially as it has only been available for about 18 months in Australia), but is set to give the competition a run for its money.

For those new to this area of computing, desktop publishing allows the user to 'compose' a page - newspaper style - on the screen, and then print it out. This allows such items as newsletters, brochures and magazines to be produced more rapidly, better looking and of course at a lower cost than by using manual cut and paste methods. Graphics as well as text can be manipulated, giving these programs real power and practical use. The power of the newer computers (combined with laser printers) has really made desktop publishing an affordable reality.

At the time of writing there are three main desktop publishing programs available for the Amiga - *PageSetter*, *Publisher 1000* and *City Desk*. All three programs provide the power of desk top publishing with graphics and text manipulation. You can take text from your favourite wordprocessor and combine it with graphics created with *Deluxe Paint* (or any other drawing program) or images captured with DigiView.

The three programs handle the application slightly differently, the best for you being a matter of personal preference.

Postscript laser printers are supported by *City Desk* and *PageSetter* - with the addition of Laser Script.

If you want the facility of mixing colour graphics and text in different fonts, without full desktop publishing facilities (such as multi-column), then *ProWrite* is worth a check out. This is a high quality word processor which is very similar to *MacWrite*, but allows you to manipulate and print out in colour!

For those really serious about desktop publishing - the Amiga will turn your head with the soon to be released program - *Professional Page*.

Professional Page offers full power desktip publishing, and in addition to driving dot matrix printers and laser printers, *Professional Page* can also output to a full scale typesetting machine. This means that the Amiga can be used to directly produce high quality brochures, magazines and artwork.

And if that is not enough - *Professional Page* will be the first desktop publishing program designed for colour work. It will produce the colour separations required for printers to produce full colour printing.

To keep up to date on developments in this exciting area of Amiga application, give High Technology a call. They have a free price list, and offer a mail and phone order service.

High Technology is at 290 Bay St, Brighton, Victoria 3186. Phone (03) 596 6211.

Specialised uses for the Amiga

Amigas and the CSIRO

Bruining Headlam Computers, one of Australia's oldest and largest Commodore Dealers have been actively involved in the development of specialised uses for Commodore equipment.

One of these area is in Satellite Image processing. The CSIRO have two departments which are currently using the Amiga . The Amiga has a number of advantages over existing image display systems. Apart from portability, the Amiga offers a means of displaying graphic information on a relatively inexpensive computer. In many cases it is not possible to display this type of information on machines costing less than $10,000 (the Amiga costs $2000).

Bruining Headlam have had to make extensive international enquiries to source some of the material used by CSIRO and have been able to initiate contact between different organisations interested in this area.

The Marine Laboratories in Tasmania (contact Paul Tidesly 002 206 222) are using Amigas in the development of low cost image systems for commercial fishermen. Temperature information is received from a number of satellites including the NOAA series, pertaining to surface temperatures of the ocean. This provides the viewer with information on warm and cold currents and where they meet in the Ocean. This is where tuna, squid and many other species of fish tend to congregate. Eventually, commercial fishing operations may be able to have an Amiga computer on board displaying information on areas which are being fished at that time.

A spin off from this is the application of Bush Fire Control. The Tasmanian fire department have purchased an Amiga from Bruining Headlam and will use it to display information on vegetation, fire spots and fire breaks.

The Division of Mathematics and Statistics (contact Norm Campbell 09 387 4733) is using the Amiga for analying Vegetation in farming areas. It is hoped that the system will eventually be used by farmers to display information on paddocks and allow them to accurately manage application of fertilizers etc. to improve the yield of each paddock.

By using Amigas from Bruining Headlam, the cost of processing and displaying the information can be less than 25% of the cost of using conventional systems.

Amigas and the Water Authority of W.A.

Bruining Headlam Computers have also been actively involved in the use of Amiga computers within the Water Authority.

One of the unique features of the Amiga computer is the ability to multi-task. This means that the Amiga is capable of running a number of programs in the one machine simultaneously.

The Authority has decided to use Amigas in remote Alarm sensing applications. There are a number of sites within W.A. including Water Treatment Plants, Sewerage pump houses etc. which cannot be manned 24 hours a day. The Water Authority has installed alarms which call an Amiga at a central site and give it details about what's happened and where. The Amiga can then look after the alarm.

Let's say a pump overheats and switches off. The alarm at the pump house detects this and telephones the Amiga. The alarm tells the Amiga what's happened, the time and where it's calling from. The Amiga then files this on disk and prints out a report. At the same time theAmiga looks up a list in its memory of which staff are available, who is the closest to the site and who is the specialist for the particular fault. The Amiga then instructs another device to call that particular engineer.

Once again, Bruining Headlam have gone all over the world sourcing some of the specialist components for this system. Once the system takes off, it could be used all over Australia in different remote alarm systems.

"Well, we are finally ready to go and it looks great !!"

Carol Jones and John Jewell, Directors of the **UNITED COMPUTER GROUP OF QUEENSLAND** are speaking about the final stage of their total three stage plan of customer support, and more specifically about their new training centres.

"Now we can offer our customers not only truly professional sales people in our three stores as we have done over the last four years, plus the service of a fast turn around time from our service centre if something goes wrong with a computer or peripheral, but now we can offer a complete training course on nearly every type of software available," said Carol Jones. "We cater for all of our computers, from the 64/128 through to the Amiga and of course the business range of the PC compatibles."

"We have three sales centres, and so it was only natural for us to open three training centres," stated John Jewell.

"This way our customers could be looked after by a training centre in their area. We will have courses for the beginner through to the person who wants to have a closer look at a major piece of software before buying.

"For the business that is already computerized and maybe using it for word processing or accounting, and would like to see the benefits of other programs without the expense of buying them first, they could come to a course on say database and its uses. This not only confirms its usefulness, but now someone within the organization has a working knowledge on how to use it," said John.

"We are very excited with the decor, the seating is very comfortable, the colour scheme relaxing, and every one who attends will have a computer of their own to work with. We have highly skilled training staff for our courses with years of experience in this field."

Country clients are not forgotten by the United Computer Group of Queensland, with mail/telephone orders welcome and a quick turnaround of product.

The three stores have one of the largest ranges of software available in Australia and new titles are arriving daily.

Many clients are joining the Public Domain Software Libraries and taking advantage of the many and varied programs available to them through this facility. The 64/128 Amiga and PC libraries each have a once only membership fee and the customer then has access to hundreds of software programs for business, education and recreation.

I tried the view options and found them to work well. I could, at a glance, see where the money had come from and gone to; ideal information for a small organisation like the AAUA or a home budgeting system. I became hopelessly lost in the "Compare with statement" area. Once in that area, you can't get out without resolving a discrepancy or blindly accepting the bank statement balance, an interesting problem if the bank proves to be wrong!

I wasted a couple of hours trying to get my printer to work. Eventually I discovered the program will not output to print if your system supports two external drives. It's the only software I've had this problem with, not a major hassle, but worth noting. Another tip: use *PHASAR* under KS/WB1.2; the disk access time under 1.1 is dreadful!

The budget functions allow the user to project income and expenditure trends and budget accordingly. A handy addition, which, if you have known commitments, should keep you out of the red. As an added bonus, *PHASAR* has an address/telephone book and diary tucked away in the "List" menu. The simple database concept performs the task adequately.

One excellent function of *PHASAR* I found quite by accident. We all dread losing data through disk errors. During my juggling of disks I created a read/write error on the *PHASAR* disk, which the program informed me of the next time I loaded it. Then to my surprise, it dutifully reconstructed the data files with no loss of information. I was impressed.

The *PHASAR* disk also contains a Taxation package. I haven't bothered with it as it is formatted for the US tax system.

PLUS:
Pull-down menus
Mouse/keyboard driven
Not copy protected
Ample "HELP" screens
Data recovery of damaged disks
Simplified data entry (default system)
Comprehensive Report generators

MINUS:
Not multi-tasking
Calendar year (not financial year)
US taxation system
Dates are only accepted in US format: MMMDDYYYY
No <ESC> from "Statement compare" option

CONCLUSION

PHASAR is well presented and does all it claims. The AAUA now runs its ledgers on *PHASAR* and it only took a few minutes to run the treasurer through the program. As I stated earlier, a home computer program should be simple to use, easy on the eye and produce the results you want. *PHASAR* passed all requirements.

I certainly wouldn't suggest BHP swap over tomorrow, but a small organization that needs a simple book-keeping system should take the time to check *PHASAR* out.

Distributed by OziSoft, (02) 211 1266. RRP is around $149. □

Barbarian

by Adam Rigby

Had a terrible day? In *Barbarian*, you can release your built-up aggression on the nasties in this underworld. This can be done by various methods, everything from chopping them limb from limb to pulverising with Herculean blows.

You play the barbarian named Hegor, not unlike a man called Conan in the same profession. Hegor, with his long blonde hair and athletic profile, is son to Thoron. Thoron and his brother, Necron, were given special powers when young by a kindly druid who warned them both that Necron would turn to evil while Thoron would oppose his brother, and stand for good. The guts of the story is that Necron fled to the underground and built the world of Durgan - which you must enter to locate and destroy him.

The packaging of the game is of very high quality and the presentation is superb - included are a poster, story outline, reference card and of course, the game.

On-screen play is controlled by a panel which sits on the bottom of the screen, accessed with the left mouse button. The panel includes directions (left, right, up and down), stop, jump, attack, defend and flee. When the right mouse button is pressed another panel is displayed with the current men status, number of arrows, timer, objects carried and three actions to manipulate them (get, use and drop).

Each screen of *Barbarian* has a problem or problems which must be overcome in order to move to the next frame. The most hazardous tend to be the varied nasties, which are beautifully presented animated sprites/blobs. The trick to *Barbarian* is timing and memory. Since there is no save facility on this game the beginning scenes must be played over and over to continue the search for Necron. This lack of a saving facility is the major drawback of the game.

Barbarian is a very well presented game which will keep you entertained for quite some time. It has enough game play to keep non-adventurers happy, and for the true video-adventurer this will surely be a treat for your senses - the dungeon-style atmosphere is excellently reproduced. The graphics are impressive; animation can become quite jerky, however, if a lot is on screen at once. The sound is adequate - a series of grunts and groans from our hero as he climbs, jumps and hacks.

Graphics	90
Sound	60
Gameplay	80
Appeal	90
Value	92
Presentation	95
Overall	**91**

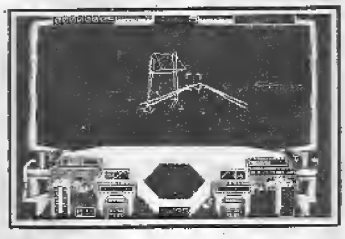
Starglider

When they say 'true arcade quality' they are not joking. Man, I thought I had seen the best of the best in smooth simulations, but this just takes the cake! This is a beautifully packages product - including disk, 64 page novella, flight training manual, full-colour poster and keyboard/loading instructions. The whole thing is presented as if it's the real thing (an understandable mistake).

You sit at the controls of the AGAV (Airborne Ground Attack Vehicle) with the control panel before you. The panel allows critical particulars of your aircraft to be monitored - these include a scanner, energy level, shield status, laser cell status, altitude meter and velocity indicator. Also shown on the console are various navigations indicators such as a sector display and heading read out; this makes it possible to construct a map-of-sorts to assist in refueling etc.

The main difficulty encountered by novice players is refuelling the energy of the ship. This must be done by flying between two energy towers at a very low altitude. The shield and agmaments are restocked at the Repair Silos, these are represented by a rotating wedge-like structure which houses the entrance. Learning how to access these two necessities quickly and easily is the key to the game - without such skill you'll soon find yourself watching a 'game over' message.

The most enjoyable way of playing *Starglider* is with co-pilot, as it is almost too difficult to succeed yourself. When I had a co-pilot to control speed, monitor the



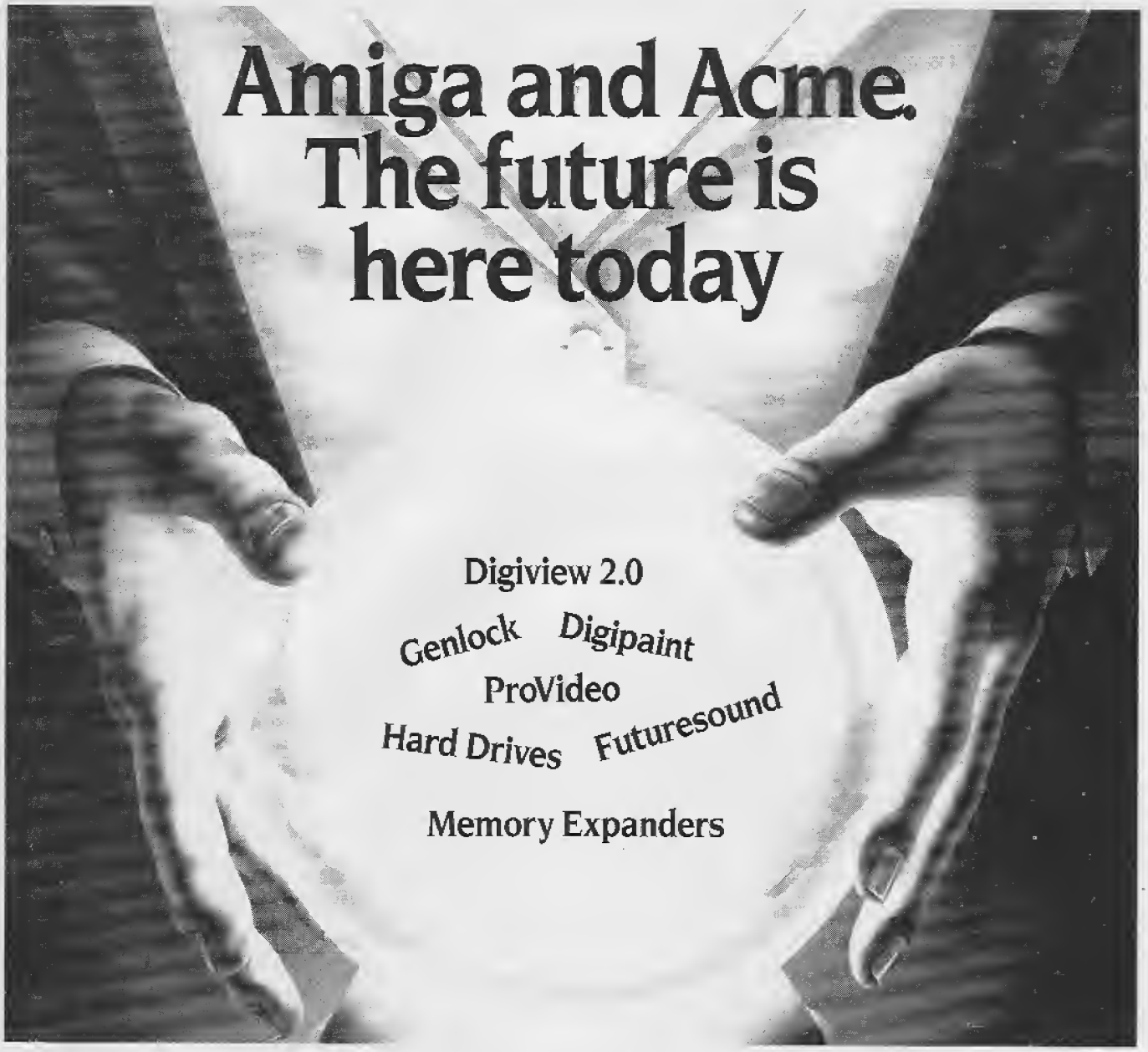
ship's status and fire missiles, my score suddenly was doubled and we were on level two - unimaginable feat!

The sound is unbelievable. The first time I experienced this game it was plugged into a 60w stereo system at full power - awesome!

Starglider is one of the most professional pieces of software on the market today. I must admit the theme of shooting down the aliens is an oldie and does not excite everyone. If not, just have a look at this game, it might change your mind.

Graphics	99
Sound	95
Gameplay	86
Appeal	85
Value	80
Presentation	95
Overall	**96**

Amiga and Acme. The future is here today



Digiview 2.0
THE Amiga video digitiser. Produce high quality images in colour or black & white in low, high or medium resolution. Uses all of Amiga's 4096 colours with the HAM option. Save images for use in other programs and more

Digipaint
The advanced drawing program utilising Amiga's HAM mode to the full. Uses Amiga's 4096 colours. Combine images with different palettes on the one screen, or work on Digiview images.

ProVideo
The character generator that is the ideal partner to Genlock. Up to 100 screens of animated text in different fonts, colours, sizes and shading can be queued for automatic display. Excellent promotional tool. (PAL version requires extra drive and 1Mb RAM.)

Hard Drives
ACME distribute the entire range of C-Ltd. Hard Drives. Capacities range from 20Mb for under $1900.00. Turns your Amiga into Super Amiga. Very fast drives that connect directly to the Amiga bus. A real winner in a recent price/performance comparison.

Futuresound
The ultimate sound digitiser for the Amiga. Digitises with NO background noise. Collect samples from your video, stereo, CD or your own voice (microphone included). It's t-t-t-t-errific!

Genlock
Turns your Amiga into a video production studio. Overlay Amiga graphics/text over a video signal. Chroma-key and fade as well. Very versatile, lots of professional and educational uses. Australian PAL system.

Memory Expanders
Expand your Amiga's memory without expanding your budget. Half, one and two megabytes of 'fast' RAM available with Auto-Config circuitry and pass through bus. An extra slot is provided so an additional 2Mb card can be added, or even a hard-drive controller. Great value and tops in quality.

Other products include:
ACME Midi Interface, ACME Real Time Clock, Digi-Droid.

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The name that guarantees support and full warranty cover.

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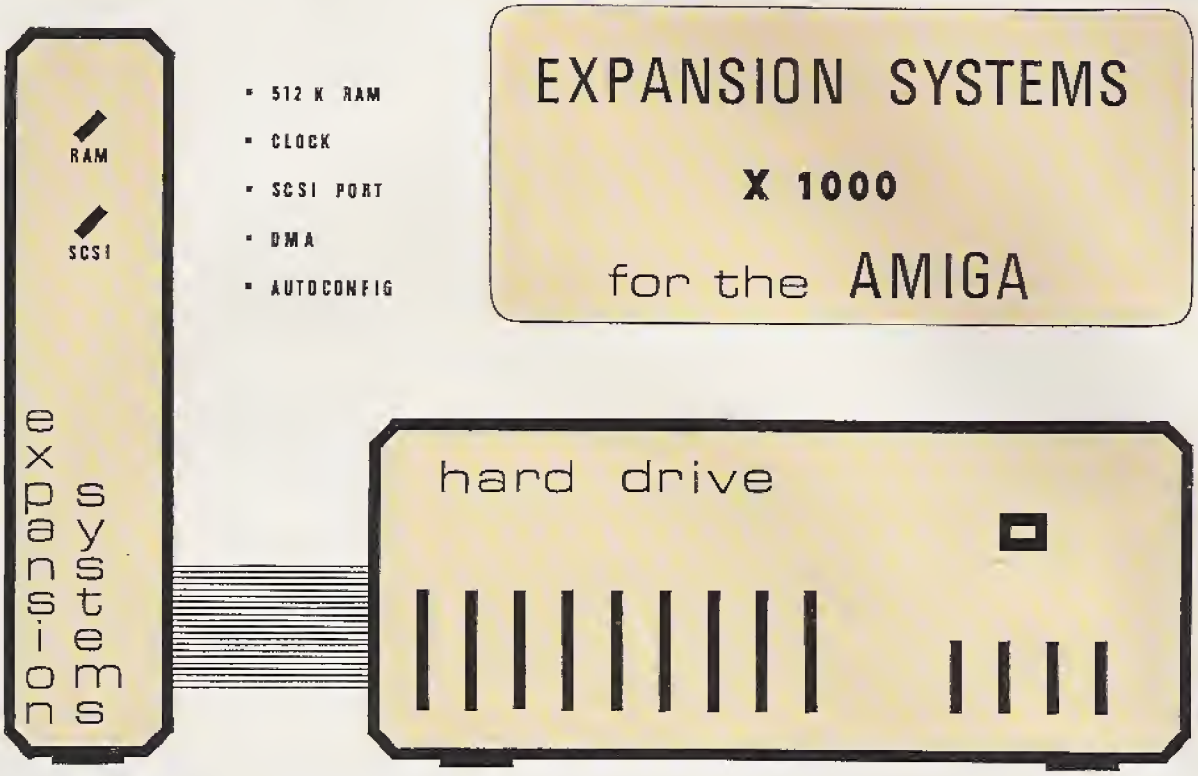
Contact us for your local ACME dealer

UNLOCK THE POWER IN YOUR AMIGA



- 512 K RAM
- CLOCK
- SCSI PORT
- DMA
- AUTOCONFIG

EXPANSION SYSTEMS

X 1000

for the AMIGA

the complete solution for the amiga 1000

In a compact 35mm footprint we put hardware to push your Amiga to new levels of performance.
The X 1000 multifunction expansion unit for the Amiga 1000 uses state of the art technology to enhance the Amiga on all fronts—

✺ **RAM** — half a megabyte of fast memory doubles your Amiga's capacity

✺ **CLOCK** — real time clock so your programs always know the time and date

✺ **SCSI** — industry standard I/O connector for hard drives, streaming tape and CD ROM

✺ **DMA** — high speed data transfers to rival workstations and minis

✺ **AUTOCONFIG** — of course

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Arcade Action

with Darren Brown

WELL, back again for another month, and have I got some new hot stuff for all you arcade buffs.

The Last Ninja

First, a game that any martial arts buff will love. *The Last Ninja.*

It is the tale of Akumani, a legendary sword fighter of the Haein period of Japan - about 900 - 1175 AD. The storyline concerns this extremely powerful shogun who captures the scrolls of the Ninja and sets himself up on an island called Lin Fen (a real place) in the Yellow Sea. Ninjas have been dispatched to retrieve the scrolls but they all fail and you, Akumani are the last to try. Fail, and Ninja brotherhood will be lost forever.

The game features six separate locations that act as levels and which load sequentially from disk or tape. The first four sections Wilderness I, Wilderness II, the Palace Gardens and the Dungeons are 25 screens large with the final two, the Lower Palace reduced to 15.

The writers have added as many adventure and arcade adventure elements as possible. The action, of course, comes first from the feet and fists of the Ninja. He's armed to the teeth with shurkien, a sword, nunchakus and a staff. As always, you have to find the items first before you can use them. There are also numerous other items that will help you along the way that you can find in your travels.

The game requires strategy as well as brute force, so don't think you will finish the game in five minutes just by killing everything.

To top the whole game off, there are 1500 multi-coloured, hi-res sprites in the game's 130 screens. So much care and attention has been dedicated to these background graphics.

Added to the fantastic graphics, you get great music from the one and only Ben Daglish and co-programmer Anthony Leigh. A total of 12 sets of music accompanying each location and six for each load.

To sum the game up it has 60% graphics, 40% programming and 10% music. To give you a total of 110%. But after playing the game, you will agree that is a fair sum. There is just so much involved that you wont finish it in one sitting. Just working out how to somersault will take an average person 10 minutes to perfect.

Overall, I totally recommend you get this one as soon as it is available in the shops. Believe me, it is worth it!

The Last Ninja

Eagles

Next on the agenda, we have *Eagles.* Hot from the keyboards of Danish programmers Per Madsen and Bo Nielsen, *Eagles* puts you in the cockpit of the most advanced fighter the Earth has ever known. Unfortunately, you're not on Earth — you're actually orbiting the beleagured planet Zinox, in a stratosphere swarming with attacking aliens. Yes, it's a shoot-'em-up, and with solo, two player team and two player dogfight options — a pretty nifty one, too. Realistic aircraft handling and a horizontally-split screen which allows you to keep one eye on your friend / foe's position at all times, are added features of this Hewson game. Should be in the shops soon.

Barbarian

Shortly due for released from Palace Software is *Barbarian.* First of all you have a test of swordsmanship against the "finest warrior in the land". In part two you have to save the Princess from the fiendish clutches of the Dark Sorcerer, Drax. Your skills are extensive, allowing you to headbutt, kick and use the "web of death" as you carry out your mission.

Other features are very well animated sword movements that you also use to defend yourself. One of the sword movements is the yummy decapitation. If you loved the movie *Conan*, you'll love this game. Watch for it soon.

Quartet

Now on the scene is another multiplayer game like *Gauntlet,* with almost the same game play, but a different setting. Get ready for *Quartet.* Here's the plot:- Space Colony 06 has been attacked and taken over by space pirates. Quartet, a private team of troubleshooters are called in to recapture the colony. The Quartet team is comprised of three men and one woman, each with his or her own attributes useful in battle. They work as a team but like *Gauntlet,* only two will be able to play at the one time.

With your team assembled you're ready to wipe out a few lousy pirates. As you work your way through the colony's 36 levels, there are devices that will increase your fighting ability, your strength, give you a jetpack or numerous other features. If *Gauntlet* was you style, add this one to your collection.

Wonderboy

Wonderboy is here! *Wonderboy* is a kid with a quest : to reach his girlfriend across treacherous landscapes and rescue her from the evil King.

Burning bonfires, tumbling boulders, poisonous snakes, killer frogs and murderous blue midgets can all make your quest a short one — but our hero can break open giant eggs to collect a stone axe, a guardian angel and other valuables to help him on his mission. A skateboard speeds up his progress and picking fruit provides bonus points.

A mastery of jumping is required in this fast action game of skill and timing. Armed with only a nappy, you set out to conquer the land and reach your girlfriend. Good action, but a bit frustrating. Check your local software supplier for this one.

And now, a game every Amiga owner will be familiar with, a game that requires strategy rather than brute button pressing. If you don't know what I am talking about, then I will tell you.

Defender of the Crown. "Never heard of it!" I hear you scream, but you will never want to forget it when you see the amazing graphics and sound.

The game is set in the year 1149, in England. The era of Robin Hood and King Richard. The whole story is based on getting the now anarchist society of England back on its feet after the assasination of the King. Even his crown has been stolen. Everyone blames each other, but while this goes on, the younger men set out to do something about it. You can choose your characters from different rulers of the time.

You start off with a castle and a handful of men as your army. It is your job to increase your land by conquest. Conquer the whole of England and the game is finished.

You have to buy soldiers, knights, catapults and castles. You earn a certain amount each month from each piece of land. The more land, the more income and the more you can buy.

Many strategies are involved and it is a welcome relief from all these new shoot-'em-ups.

Quartet

Overall *Defender of the Crown* is a great game and is a must to see, even if that's all it is, a look, 'cause it is well worth it.

Now for the News

You may have heard of the new James Bond film, *The Living Daylights*. Well, Domark are set to release a game about this great new film. According to what I have heard, the game will be much more of a shoot-'em-up than the last Bond game was. The game will feature all of the locations that are shown in the movie, plus many others. There will even be a part of the game where you go into Q's office and choose your weapon. This new Bond adventure is set to be a hit.

Now, unfortunately, here is a bit of bad news. Despite considerable pre-release publicity - including large adverts in many major magazines - Melbourne House have decided to junk their *Inspector Gadget* game in all formats. So if you see any reviews of the game anywhere you still wont be able to buy it.

The official line is that the Melbourne House people didn't think the game was up to scratch. I have actually seen a pre-release of the game and, I myself, think it was perfectly good, although it could do with some improvements.

Now that we are over that bad news, here is some good news for all *Gauntlet* fans. US Gold have released the promised *Deeper Dungeons* add—on for all versions. More dungeons and treasure-filled rooms to explore. You'll need the original game to load the new dungeons. From what I have seen the *Gauntlet* fans will love them.

I think that's about all for this month. Hopefully, I will be back next month to review more great games, but until then, look around for this month's reviewed games. They are definitely worth it !

Catch ya next month.

Wonder Boy

NetComm believes Commodore owners have waited long enough.

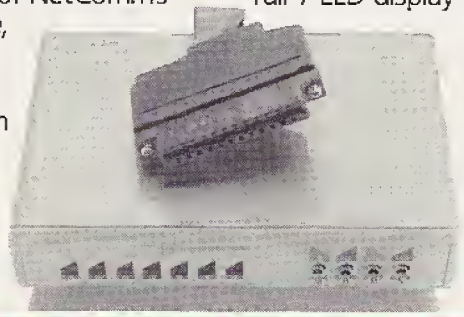
It seems Commodore owners are a patient lot.

While other PC users were discovering the delights of communications, you had to wait for someone to design a modem just for you.

And while the others were enjoying the convenience of auto dial and auto answer, you were left waiting again.

But now, with the introduction of NetComm's Modem 64/128 for Commodore, your wait is over.

The Modem 64/128 is a full-feature, two-speed auto modem compatible with all existing commercial and public domain software, including Commodore 1650 software.



It operates at 300/300, 1200/75 and 75/1200 baud.

It comes complete with Videotex and Terminal software and even a VIATEL subscription form.

It provides auto dial, auto answer and auto disconnect features you'd only expect to find on much more expensive modems.

All modem features are software controlled, with a full 7-LED display reporting all operational modes.

And it comes complete, with Telecom approval, ready to plug in and run.

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Virtuoso 64

This is the latest in a long line of music entry programs to cross my desk and it's the best I've seen. The method of entry is simplicity itself and the end result is as good as any I've yet heard.

IT'S billed as a powerful and flexible music editing system that takes your C-64 to its musical limits.You can compose or write music quickly and easily with this system and the result is pleasant and useful. The music files you create are very compact so that very long compositions can be held in memory for a complete performance without further disk access.

The code is interrupt-driven and relocatable and can be used in your Basic or ML programs using the driver program supplied. This is a handy feature if you want to have music playing whilst you do other work or if you've written a game and want to have short musical sound effects to signal various stages.

Your loader program would load these themes to memory and your game program would then call each theme, as and when required, by the SYS to the memory location you've chosen to put the theme music.

It's explained in the instructions which come on the disk and which you print out on your printer.

The program is nice to work with when you've spent just a few minutes reading the aforementioned instructions. I always read manuals through without really comprehending too much (my usual style!) then jump right in and start to use the program.

I had a short tune eight bars long processed in a few minutes. The entry method is probably the easiest and the suppliers claim that what would take an hour to process with the *Music Construction Kit* can be processed in five or six minutes with *Virtuoso 64.*

I haven't done a comparison for myself, but having used so many other music-entry programs I can believe them on this point, as I found the method easy and quick.

The screen displays a double staff (like blank piano manuscript), numbered across the top and bottom to indicate which beat of the bar (called a "measure" in the American convention) the cursor is currently on. Displayed vertically down the left of the screen are the note names on each line and space together with the relevant octave number

"It's billed as a powerful and flexible music editing system that takes your C-64 to its musical limits."

You know where you are by looking at these numbers and letters. The display screen is part of a vertical window and if you need to write notes higher or lower than the lines shown on the staff then you scroll up or down by using the cursor keys.

There's a feature called Edge Scroll which lets you scroll sideways to the adjacent measure either next or previous.

Notes are entered by using the 1, 2 & 3 keys and refer to the three voices on the C-64. The instructions suggest that you place your left hand over the number keys and your right hand over the cursor keys for fast music writing. When you press the appropriate number key the number appears on the line or space where you placed the cursor with the cursor keys.

Numbers are displayed instead of note-heads and you can see at a glance which voice is playing what note. Rests are entered by using the 4, 5 & 6 keys and a rest is shown as R3 for a rest in the 3rd voice. Any note written will continue to play until the next written note is encountered.

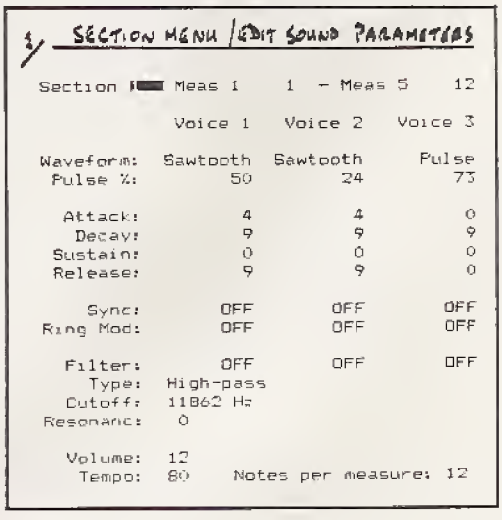
This idea cuts out the need for ties and makes writing much simpler to do. The same concept applies to rests and once you've used this program I think you'll agree that it's a marvellous way to write music.

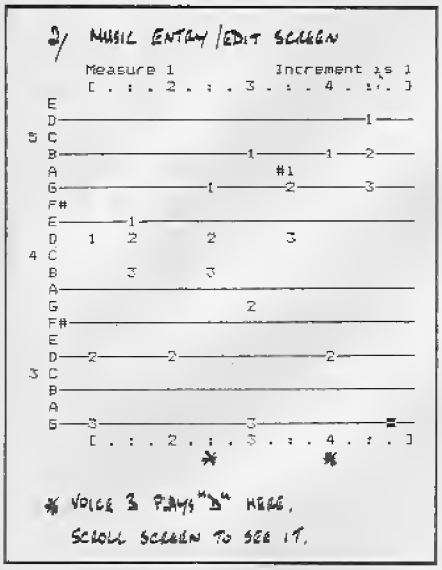
Three-stage method

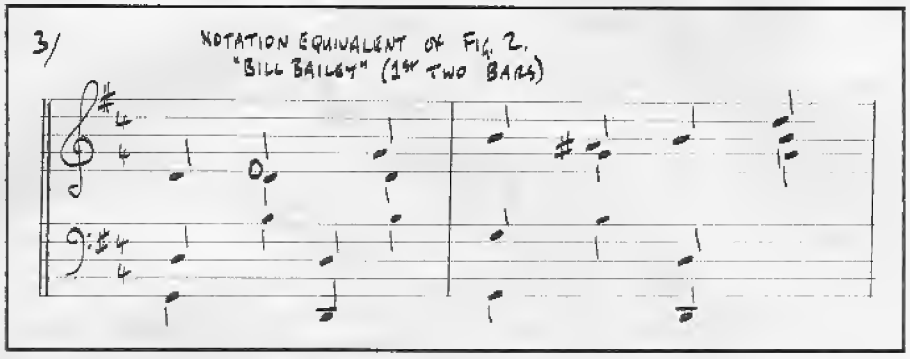
Virtuoso 64 uses a 3-stage method of building a music file. There are measures (bars), sections and pages in this method. You enter music into a Measure in the Input Mode without having to bother about repeat signs, tempo changes or sound quality. You just put the notes in their right places.

In Section Control you define how the music is to sound by controlling the ADSR (Attack, Delay, Release & Sustain) along with tempo, sound filters and other special effects. It's here that you define in what order the measures of music are to be played. You may wish to repeat measures 1 to 16 straight after measures 32 to 48 and a command here will do that.

If you want the repeated measures to







play louder or softer, faster or slower or in a different octave, you can do that in Section Control. In Page Control you have the facility to tell the program when to play the Sections that you've designed and in what order. So, Measures contain the notes, Sections contain the playing instructions for all Measures, and Pages contain the playing instructions for all Sections.

It sounds a lot more complicated than it really is, but isn't all explanation of any computer subject like that? I find that a thing that takes 30 seconds to demonstrate on the actual keyboard can take a page and more of written instruction.

When playing a piece done with *Virtuoso 64* you're treated to a display showing from left to right: the Page number, Section number, Measure Number and Note number. Below that is shown the Section as you defined it and below that is a display showing what sound attributes each voice has. Below that again is shown the Volume and Tempo of the piece being played. The screen is extremely functional, as are all *Virtuoso 64* screens, with the emphasis on functional rather than flashy graphics.

Screen colours are Medium Gray background with major lettering in black, page numbers etc in white, and the voices in different colours. Voice 1 is yellow, voice 2 is red and voice 3 is blue.

Everything you need to write good music code is here and ready to go to work. When working and you need help you just press "H" and the help screen comes up. It is available at any time from any screen.

With regard to the commands, when you print your instructions out you get a separate sheet showing a command summary. There are some hints too as well as a step by step example of how to set up a piece of music in this Page, Section & Measure method.

To perform repeats of certain parts of the music you set it up by using Section Control but if, whilst actually writing, you wish to use Measure 1 in the same place as measure 7 you simply use COPY to effect the automatic writing of that new

measure. This can be done with one or several measures with you setting the start and end of the range of measures to be COPIED.

> "Everything you need to write good music code is here and ready to go to work."

This is like Cut and Paste in a word processor except that it duplicates rather than moves a range. If you do want to do this you use another feature called MOVE which removes the measures from their original position and puts them where you want them. Another command is OVERLAY which allows you to put a measure on top of another one without erasing current notes unless they conflict voice-wise.

When editing your music you may GOTO any measure you specify by number.

You may also INSERT blank measures or DELETE a range of measures as well as LOAD, SAVE, TRANSPOSE, APPEND etc etc and commands are performed by pressing a single letter. These commands are shown on the command summary sheet.

Once you get proficient in the use of *Virtuoso 64* you can use the Macro feature which allows you to define a string of up to five characters which will be entered automatically at the cursor position whenever you press "/" followed by the single letter name of your macro definition.

This is useful for inputting a pattern of notes or cursor movements. If you were to enter Ravel's Bolero and use voice 3 as the percussion you could define the rhythmic pattern as a macro called "R" and input it in every new measure by typing "/R". The ways to use this feature is only limited by your own imagination.

One beef I had was the lack of specific instruction as regards inputting triplets, 32nds and 64ths. The accompanying literature said that they're all possible, "require a little manipulating but turn out well." This they certainly do as you'll hear from the Paganini piece on the master disk.

Triplets are well done here and serious users would check out the way that they've been done in that piece and use the same method themselves. I checked out all the pieces which come on the disk for the use of triplets, those pieces are: *Won't you come home Bill Bailey*, Pachelbel's *Canon*, Beethoven's *Fur Elise*, *Bumblebee Boogie*, Bach's *Brandenburg Concerto No 3*, an un-named Paganini piece plus five of Joplin's rags: *The Entertainer, Maple Leaf Rag, The Sycamore, Weeping Willow* and *Eugenia*, plus one he wrote in collaboration with Arthur Marshall: Swipesy Cakewalk.

All are well done, and just for interest I checked out the sheet music for much of them and couldn't find anywhere where Scott Joplin used the triplet figure. It's not used in the Bach or Beethoven pieces so the Paganini was the only piece that did use triplets. The suppliers of Virtuoso 64 are Chipmunk Software of Battleground, Washington.

They send out a catalog on a disk which keeps you up to date with all their products. They have a nice product range for both C-64 and Plus-4 comput-

ers, also some handy books on customising drives, building computer furniture etc etc.

I got some Music Collections on disk along with the *Virtuoso 64* program, they're called "Strider's Computer Classics" and are on the price list at $9.95 per disk (or 3 for $27).

One of them was a Scott Joplin disk with *The Entertainer, Elite Syncopations, Peacherine Rag, Leola, Maple Leaf Rag, Easy Winners, Swipesy Cakewalk, Ragtime Dance, Pineapple Rag, Weeping Willow, The Paragon* and *The Strenuous Life*. The other one was a disk of Bach's *Well Tempered Clavier* which included Fugues 2,7,9,10,11,21 and Preludes 1,2,5,6,11,14,20,21,23.

Each disk has a file of Program Notes covering the disk's contents and each tune, when loaded and playing, displays several screens of text about the tune and it's composer's history.

The Strider disks come up with a title screen when playing the introductory music then present a "select by letter" menu for music choice. These disks come out on a monthly basis and are created by Lorne Strider using the *Virtuoso 64* program.

If you have any music files created by *Master Composer* there's a conversion file on the *Virtuoso 64* disk which makes them *Virtuoso* compatible.

If you're interested in a simple to use yet full-featured music program then I suggest that you have a look at this one.

Virtuoso 64 costs $29.95 from Chipmunk Software, 631 North Cherry Street, Battleground, Washington, USA 98604. Phone 1-206-687-2343.

All quoted prices are in US dollars.

EUPHONY

An update by Eric Holroyd

I liked this music program so much that I contacted the guy who wrote it, Jim Raymond of TCO Software of Alaska. He was delighted that his program has made an impact and said that he regularly quotes a satisfied customer in ads as "Mr M.L. of Castle Cove, Australia". His ads show many more "satisfied customer letters" and I believe rightly so. It's a good program .

Mr Raymond sent me details of the updated version, known as *Euphony 3.0*, which has many new features. Here they are.

It's now permissible to use 64th notes and dotted 32nd notes, also any combination of durations can now be done. Previously some combinations were not "legal" in this program but that's been fixed.

There's a new, improved voice menu where the cursor will only move to "legal" positions. In previous versions you could put the cursor anywhere and inadvertently cause a problem if you pressed the return key with the cursor in the wrong place. There's also an improved Help menu.

One thing I was a little critical of in the previous version was the preset (and unchangeable) screen colours. I felt that different colour choices could have been a benefit to users who have a normal TV set instead of a monitor and who therefore don't get as good screen resolution. This new version allows you to set the colours to whatever you like best and the change is written to disk so that your own choice of colour comes up every time.

There's better access and control to the sound chip with noise waveform, vibrato, sync and ring modulation all being easily available when designing your instrument sounds. The preset instruments are still there too.

The metronome frequency and/or time signature can now be located in variables and you can therefore change the timing or speed of the piece in the middle of a phrase, whereas before you had to define it at the start of a phrase. There is now no restriction on where you put this command.

In the areas of disk and file handling there are a couple of nice changes too. The Number command (for renumbering source files) is now stored in RAM so that renumbering and inserting is done almost instantaneously. Also, the disk directory now shows the file-length.

There's now a key displacement command which actually allows you to save a piece of music in a different key to the one you wrote it in. You just change the key of the file by transposition then save it with this method, it's that simple. Of course, you'd need to use a slightly different filename if you wanted to save several versions of the same file on one disk but you could put the key into the filename to make recognition easy. For example, Blues in C could be the same tune as Blues in A but transposed and saved with the key displacement command.

Three hours of music

Finally, whilst Music Collection 1 is included on the program disk, you now get a second disk with Music Collections 2 and 3 which gives a total of three hours of music ready to play on your 64.

Here's what you get in the Music Collections:

Collection 1:

Beethoven's Waldstein sonata, Bach's Fugue in D minor, Mozart's Sonata in A minor, Introduction to Chopin's Polonaise in A flat, Pachelbel's Canon in D, plus pieces by Scott Joplin and others.

Collection 2:

Introduction to Beethoven's Appassionata, Mozart's Sonata No 9 in A minor, Bach's English Suite No 2. There's the Sinfonia, Chorus, Arioso, Air and Hallelujah Chorus from Handel's Messiah plus many hymns and Christmas carols.

Collection 3:

Bach's Brandenburg Concerto No 3 (John Pearce's theme music), Mozart's Sonata No 11, Debussy's Golliwog's Cakewalk, Chopin's Fantaisie Impromptu, together with pieces by Tarrega, Albeniz, Prokofiev,Couperin and others.

Collection 4:

(Sold separately for $7.50 plus $1.00 shipping) Beethoven's Moonlight Sonata, Bach Bourrees, pieces by Brahms, Mozart, Schumann and more.

Each Music Collection runs for approximately one hour.

Further information sent from TCO Software includes the following:

If you don't want to enter or write music you can just get ***Euphony Junior*** which is the program that plays the Music Collections. Included are Collections 1,2 & 3.

Euphony+ is the same as ***Euphony 3.0*** with the addition of printer drivers for Epson and Star Micronics printers which enable you to print out your music.

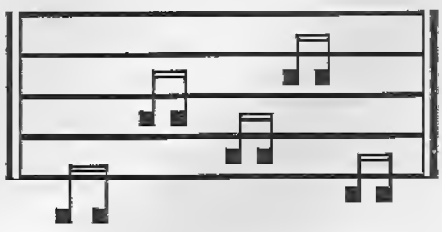
Euphony Junior -
$19.95 + $2.00 shipping

Euphony 3.0 -
$39.95 + $2.00 shipping

Euphony+ -
$44.95 + $2.00 shipping

All prices quoted are in US dollars.

TCO Software Box81504,
Fairbanks,Alaska,99708
Ph 907-479-4898



One liners

by Paul Blair

THE first routine is one I've always wanted, and the C128 makes it easy. There I am, wanting to print something on the screen, jump off to another spot to print something else, then return to where I left off, to print more.

Basic 7 has two routines to help me do this, SAVEPOS and RSTRPOS at $CC1E and $C932 respectively. SAVEPOS saves the current cursor location (column and row) at $DE/$DF. RSTRPOS recovers them and puts you back whence you came.

Try this from Bank 15.....

```
1SCNCLR:CHAR0,4,7,"THISISUP HERE"
2SYS52254:SLEEP2:CHAR0,11,20,"LOOK!"
3SYS51506:SLEEP2:PRINT" AGAIN"
```

The second routine came of desperation. I wanted to find (quickly) where a certain program was stored on a disk. I tried reading the directory, but that all takes time. Too slow.

Then I figured that the 1541/1570/1571 Disk Operating System does it all anyway when it opens a file. Hmmmm.

The trick is to find which internal buffer has been set when the OPEN command is issued. DOS uses location $F9 in the disk drive to store the number of the buffer (0-5 in the 15** drives) that will be used. Line 20 reads the buffer number.

Knowing this, we have identified which of the "pairs" of track and sector values stored between $06 and $11 in the drive we want for the file in question. Buffer 0 uses $06 and $07, buffer 1 uses $08 and $09, and so on. A quick fix in line 30, and we can get the values we want.

```
10SCNCLR:Z$=CHR$(0):INPUT"WHICH FILE";NM$:OPEN15,8,15
20OPEN2,8,2,NM$:PRINT#15,"M-R"CHR$(249)CHR$(0)CHR$(1)
30 GET#15,A$:BF=6+2*ASC(A$+Z$)
40PRINT#15,"M-R"CHR$(BF)CHR$(0)CHR$(2)
50GET#15,A$,B$:TR=ASC(A$+Z$):SC=ASC(B$+Z$)
60CLOSE2:CLOSE15:PRINT"TRACK"TR"SECTOR"SC
```

Define your wishes

Part II

This month Jason Briggs tackles some of the more fancy stuff - multi-coloured characters, memory positions, and UDG's without CBM transfer.

Multi-coloured UDGs

Multi-coloured UDG's, so what's the big deal about multi-colour? It just makes your programs look really 'unreal' or 'virtual' if you're a science freak.

Another reason for using multi-coloured UDG's is to gain a graphics effect that normally you wouldn't be able to.

These are only two reasons; as we learn about the multi-colour feature, you will probably find more uses.

Read on and learn, I hope!

Designing multi-coloured UDG's is a very long and tedious job, that is if you don't have a good character editor.

To ease things a little I think that you should read the following information. For starters, try the *Australian Home Computer GEM,* Vol 2 No1, page 38, under the heading of Designing Multi-Colour Sprites.

After you have read this try Multi-Colour Mode Graphics on Page 115 of the Programmer's Reference Guide.

Both of the above references should pretty well cover the topic, but what if you don't have either of them? Well, the first thing you should do is go out and buy the Programmer's Reference Guide, that is if you intend to get into programming in a big way. The second thing you should do is read the brief outline that I have supplied below. If you feel quite at ease with the designing of Multi-coloured UDG's then just skip over the next section.

Designing multi-coloured UDGs

When it comes down to the crunch line, there is really only one difference between designing normal and multi-coloured UDG's.

This difference is in the grid size of the UDG. As I mentioned in Part I of this article (*Australian Commodore Review* Vol 4 No 6, June), the normal UDG grid section is made up of eight bits wide, and eight bits down.

When we enter multi-colour mode, this grid changes in size and becomes four wide, and eight down.That isn't to say that multi-coloured UDG's are only half the size of normal ones.

Instead you must learn to work with pairs of bits, the computer no longer colours in just one bit. It does in fact colour pairs of bits in the same colour.

This means that your bits across in multi-colour mode, are twice the size as those in normal mode. The reason behind doing this is so that you have a choice of three colours, any of these three colours can be chosen by selecting the correct combinations of bits.

This is better explained in the diagrams below.

This combination selects background colour. (Register - 53281)

This combination selects colour #1. (Register - 53282)

This combination selects colour #2. (Register - 53283)

This combination selects colour RAM. (Register - colour RAM)

This means that when you draw up a design grid for multi-colour UDG's, you have to use one of these combinations to get the desired shapes.

The colour values of these bit combinations are selected by POKEing the desired value into multi-colour registers. (Also shown above.) As you can guess from above, the first three colours are set for all of the UDG's. That is to say, if you select red for colour #1, then ALL of the UDG's which have colour #1 in them will use red. This also applies for colour #2, but there is something special about the colour memory. What does it mean by colour memory?

OK, this is really going to be difficult for me to explain, but here goes.

The colour Ram combination is a feature that allows us to decide which characters are going to be multi-colour. Let me put it to you another way, what would happen if you used normal text characters, with multi-coloured graphics? I'll tell you what would happen, your text characters whould be an absolute mess. As in 'Yharr!! Go for the reset switch.' This is where the colour Ram option comes into its own.

If you so wish, we can select a certain character to be either multi-colour or normal colour. Well, how is this done?

Easy, if we choose to place one of the first eight colours into the colour Ram, then this will display that character in normal colour. If on the other hand you choose one of the last eight colours, (ie. 8-15), then the UDG's will be displayed as multi-colour. To make this a little clearer, study the following list.

COLOUR CODE	EFFECT
0	Normal colour mode - character black.
1	Normal colour mode - character white.
2	Normal colour mode - character red.
3	Normal colour mode - character cyan.
4	Normal colour mode - character purple.
5	Normal colour mode - character green.
6	Normal colour mode - character blue.
7	Normal colour mode - character yellow.
8	Multi-colour mode - Ram colour black.
9	Multi-colour mode - Ram colour white.

10 Multi-colour mode - Ram colour red.
11 Multi-colour mode - Ram colour cyan.
12 Multi-colour mode - Ram colour purple.
13 Multi-colour mode - Ram colour green.
14 Multi-colour mode - Ram colour blue.
15 Multi-colour mode - Ram colour yellow.

There is one more thing that you'll need to know. And that's how to turn multi-colour mode on and off. Actually it was pretty poor of me to leave this till now, but better late then never I guess.

POKE53270,PEEK(53270)OR16
- This turns multi-colour on.
POKE53270,PEEK(53270)OR16
- This turns multi-colour off.

Well, that's all there is to it. Quite easy if you think about it - well, maybe it isn't. I feel as though I may have made a rather bad job of explaining this section, but then again I had a lot of trouble understanding it at the beginning too. So to help you out, I've done up a small demo listing.

If you have any troubles, just refer to the REMarks for an explanation. This demo will simply show you a few lines, some in multi-colour, and some in normal mode. However, it should be noted that the entire screen is set in multi-colour mode. The lines are just printed using different colour Ram values.

And one more thing, always be extra careful when designing multi-coloured UDG's. It's a common mistake to get the pairs of bits mixed up when design is done manually.

```
5 PRINTCHR$(142)
10 POKE52,48:POKE56,48:CLR
20 POKE56334,PEEK(56334)AND254
30 POKE1,PEEK(1)AND251
40 FORI=0TO511:POKEI+12288,PEEK(I+
53248):NEXT
50 POKE1,PEEK(1)OR4
60 POKE56334,PEEK(56334)OR1
70 POKE53272,(PEEK(53272)AND240)+12
80 REM — THIS IS THE NORMAL CBM
TRANSFER PROGRAM —
90 POKE53270,PEEK(53270)OR16:REM THIS
TURNS MULTI-COLOUR ON
100 POKE53280,0:REM BORDER BLACK
110 POKE53281,6:REM SCREEN DARK BLUE
120 POKE53282,5:REM COLOUR #1 GREEN
130 POKE53283,12:REM COLOUR #2 MED-
GREY
140 PRINT"[BLK]NORMAL COLOUR - VALUE
0"
150 PRINT"[WHT]NORMAL COLOUR - VALUE
1"
160 PRINT"[RED]NORMAL COLOUR - VALUE
2"
170 PRINT"[CYAN]NORMAL COLOUR -
VALUE 3"
180 PRINT"[PURP]NORMAL COLOUR -
VALUE 4"
190 PRINT"[GRN]NORMAL COLOUR - VALUE
5"
200 PRINT"[BLUE]NORMAL COLOUR - VALUE
6"
210 PRINT"[YELO]NORMAL COLOUR -
VALUE 7"
220 PRINT"[ORNG]MULTI-COLOUR - VALUE
8"
230 PRINT"[BROW]MULTI-COLOUR - VALUE
9"
240 PRINT"[LRED]MULTI-COLOUR - VALUE
10"
250 PRINT"[GREY1]MULTI-COLOUR - VALUE
11"
260 PRINT"[GREY2]MULTI-COLOUR - VALUE
12"
270 PRINT"[LGRN]MULTI-COLOUR - VALUE
13"
280 PRINT"[LBLUE]MULTI-COLOUR - VALUE
14"
290 print"[GREY3]MULTI-COLOUR - VALUE
15"
```

Memory addresses for your UDGs

This has got to be one of the easier topics to write about, after all I only have to explain to you the possible memory positions and what we use them for. Those of you who are familiar with my writings are probably saying, "Here he goes again!! Why are you doing this to us, Andrew?"

Well I've got good news for you, and NO Andrew isn't going to get rid of me. (I HOPE! Gulp.)

The good news is that this is really simple. First of all, there are three places in the C64's memory where UDG's are most often placed. These memory addresses are listed below:

12288 - 14328 or $3000 - $37F8
8192 - 10232 or $2000 - $27F8
2048 - 4088 or $0800 - $0FF8

As you can see, all three of these memory areas are located pretty low in memory. This has both advantages and disadvantages.

The first and most obvious is that it leaves very little room for a BASIC program. For those of you who don't know where the BASIC programs normally start, they are located at 2048 and gradually move up in memory.

Let's look at the three memory locations in relation to BASIC Ram.

2048 - 4088 or $0800 - $0FF88

Is ruled out straight away. This memory location sits smack on top of our BASIC programs, so of course it is useless, right? WRONG! There are two ways that the more advanced programmer could use this area of memory for his/her UDG's.

The first comes into use when we start programming in Machine Code. Most people know that Machine Code can be placed anywhere in memory, that means putting your UDG's down in this memory location would be quite handy. Let's face it, placing UDG's down there is a great way of keeping them out of the way of everything else.

The second way of using this memory area would be to transfer your BASIC Ram to a high starting location. However that is a long story in itself, and needless to say is beyond the level of this article.

8192 - 10232 or $2000 $27F8

This area of memory is a little more interesting to the average user. For starters, you don't have to start swapping BASIC Ram about to use it. And secondly, we are given a limited amount of room for a Basic program, this means that you won't have to dive into the world of Machine Code.

Well, what are its disadvantages? I guess the fact that it leaves you with only about 6K to write your Basic program in. Those of you who do understand Machine Code, can once again use the area for storing UDG's and place other information around them.

12288 - 14328 or $3000 - $37F8

I've kept this one till last because it's the best general purpose memory area. As you can see, it gives you roughly 10K of Basic Ram to muck about with. To the Machine Code programmer, it allows ac-

cess to the surrounding memory locations for storage of other information.

The only real hang up I would have about using this area is the fact that it is located so high. When programming in Machine Code, I prefer to use that area for storage of screen data etc. This is my advice to other MC programmers, unless you wish to do something special, then use one of the lower memory areas.

This brings us to our next snag, how do we tell the computer where our new character set is? Easy, with one of the following three command lines:

POKE53272(PEEK(53272)AND240)+12 - This will set the characters at 12288.
POKE53272(PEEK(53272)AND240)+8 - This will set the characters at 8192.
POKE53272(PEEK(53272)AND240)+3 - This will set the characters at 2048.

Well, those are the command lines, and you can see from the remarks exactly what each line does. You should have used them before from Part Iof this article, and I therefore assume that you are familar with the use of all three. If you're not, then to use one of the lines above, just type it in. Either in a program, or through direct entry.

You now know where you can place your UDG's and how to activate them. So why don't you try putting your little bag of tricks into use?

When you're writing your UDG's program, try including some multi-colour designs, then switching into multi-colour mode.

I haven't done you up a demo at this point in time, because I wish to cover one more topic, then hit you with it all at once. Once you have written your own doodle program, and are happy with it, please read on.

UDG'S without CBM transfer

Now we come to the last topic that I will cover in this article - how we can use UDG's without first transfering the Commodore character set into Ram. And how can we possible carry out this piece of black magic? Simple, just read in your new character data. Don't bother about doing any transfer routines first.

But before you rush in and do that, there are a few little things you have to know. These snags should be checked of in this order.

1) Ensure that you have data statements for all of the characters. This includes A-Z, the SPACE character and the numbers 0-9.

2) Once you have all of that data, make sure that it is placed in the correct order, ie, that the data for the character A, is in the correct memory location for the keystroke A.

If you follow these two hints you can't really go wrong. However, please note that I have stated the SPACE key in particular. Failure to redesign the SPACE character will have some pretty ugly side effects. The data for a normal SPACE character is easy, 0,0,0,0,0,0,0,0 That's it, please make sure that you put it in correctly.

So that you know which character follows which, you should refer to the Programmers Reference Guide, Page 376, Appendix B. From looking at this table, I can tell straight away that the colon follows on straight after the digit nine.

In time you will come to remember the order quite well, but make sure that you have the list at all times.

That's about all that we really need to know, from here on in the sky is the limit.

I've done you up a little demo program that covers multi-colour mode, memory addresses, and UDG's without CBM transfer. So if you have queries, this program should sort you out.

```
10 POKE53270,PEEK(53270)OR16: REM
SWITCH TO MULTI-COLOUR MODE
15 POKE53282,0:REM COLOUR #1 - BLACK
20 POKE53283,8:REM COLOUR #2 -
ORANGE
70 POKE53272,(PEEK(53272)AND240)+
12:REM SWITCH INTO UDG MODE
80 FORI=12288TO12551:READA:POKEI,A:
NEXT:REM READ IN UDG DATA
90 DATA85,169,169,169,85,154,154,154
100 DATA126,102,126,102,102,0,0,0
101 DATA120,102,120,102,120,0,0,0
102 DATA126,102,96,102,126,0,0,0
103 DATA120,102,102,102,120,0,0,0
104 DATA126,96,120,96,126,0,0,0
105 DATA126,96,120,96,96,0,0,0
106 DATA126,96,102,126,6,30,0,0
107 DATA102,102,126,102,102,0,0,0
108 DATA24,24,24,24,24,0,0,0
109 DATA30,6,6,102,126,0,0,0
110 DATA96,102,120,102,102,0,0,0
111 DATA96,96,96,102,126,0,0,0
112 DATA102,126,126,102,102,0,0,0
113 DATA126,102,102,102,102,0,0,0
114 DATA126,102,102,102,126,0,0,0
115 DATA126,102,126,96,96,0,0,0
116 DATA126,102,102,102,126,12,15,0
117 DATA126,102,126,120,102,0,0,0
118 DATA126,96,126,6,126,0,0,0
119 DATA126,24,24,24,24,0,0,0
120 DATA102,102,102,102,126,0,0,0
121 DATA102,102,102,102,24,0,0,0
122 DATA102,102,126,126,102,0,0,0
123 DATA102,102,24,102,102,0,0,0
124 DATA102,102,126,24,24,0,0,0
125 DATA126,6,24,96,126,0,0,0
126 DATA120,96,96,96,96,96,120,0
127 DATA12,26,48,124,48,98,252,0
128 DATA30,6,6,6,6,6,30,0
129 DATA0,24,60,126,126,24,24,24
130 DATA0,24,56,127,127,56,24,0
131 DATA0,0,0,0,0,0,0,0
200 FORI=12672TO12751:READA:POKEI,A:
NEXT
201 DATA126,102,102,102,126,0,0,0
202 DATA24,120,24,24,126,0,0,0
203 DATA126,6,126,96,126,0,0,0
204 DATA126,6,126,6,126,0,0,0
205 DATA102,102,126,6,6,0,0,0
206 DATA126,96,126,6,126,0,0,0
207 DATA126,96,126,102,126,0,0,0
208 DATA126,102,6,6,6,0,0,0
209 DATA126,102,126,102,126,0,0,0
210 DATA126,102,126,6,6,0,0,0
220 REM --- DEMO ---
230 POKE53280,0:POKE53281,5
240 PRINT"[CLR][LTGRN]@@@@@@@@@
@@@@[WHT] THAT IS IN MULTI COLOUR"
250 PRINT"[DWN][YEL]@@@@@@@@@@
@@@[WHT] THAT IS IN NORMAL COLOUR
MODE"
260 PRINT"[DWN][BLK]ABCDEFGHIJKLMNO
PQRSTUVWXYZ"
270 PRINT"[\]^ 1234567890"
```

Well, that's that. Nothing more that you shouldn't be able to work out for yourself, with time of course. The most important thing that you should do is get a decent character editor. I've been informed that a person can get hold of a excellent character editor from Disk Magazine Number Four. So give it a go, there's nothing too difficult about UDG's.

The fast change button

by Joe Fixit

WHEN I bought my Commodore 128D it was to be used as a word processor (*Superscript*). The fact that it could mimic the C64 was an added bonus.

I soon acquired some games (for the kids, of course) and having had a VIC-20 with datasette previously I was pretty impressed with the speed at which disk-based programs were loaded.

Eventually, however, I realised that the 1571/1541 disk drive is not fast as disk drives go, so when I saw the Fast Load cartridge for sale I thought I'd give it a go, even though I wasn't sure that it was compatible with the 128 in 64 mode.

It is compatible and it is effective in speeding up the disk loading sequence. But it locks the 128 into 64 mode.

This is because the kernal reset routine in conjunction with the memory management unit (MMU) checks pins 8 and 9 of the expansion connector.These pins are called game and exrom respectively and if either or both of them are low during the reset routine then the 128 switches to 64 mode.

These pins have other functions also, but suffice it to say that the Fast Load cartridge holds exrom low.

I soon tired of plugging the Fast Load cartridge in and out and winced at the thought of the contacts in the expansion connector fatiguing or being accidentally bent.

Some means of switching the cartridge in and out was needed. Having been employed in the electronics industry for over 20 years (good grief, is it that long) and having designed and built quite a few successful audio, video and digital devices I felt confident that the Fast Load cartridge could be modified.

So, biting the bullet, I gingerly opened my cartridge and began by analysing the internals. Basically, all that is in the cartridge is a 7407 to perform some logic and buffering functions and a ROM (similar to the 23256 as used in the 128) mounted on a double sided printed circuit board.

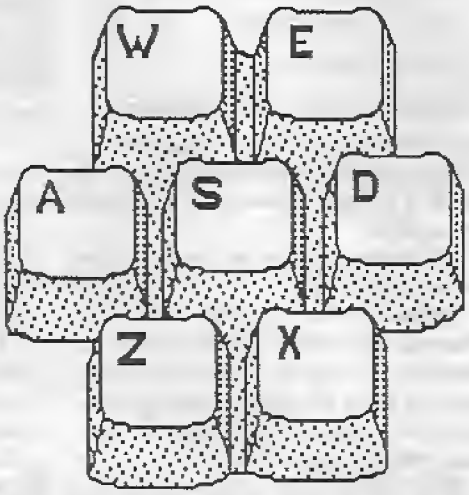
The exrom line was easy to disconnect but somehow the eight data output lines had to be disconnected to prevent unexpected craziness occurring.

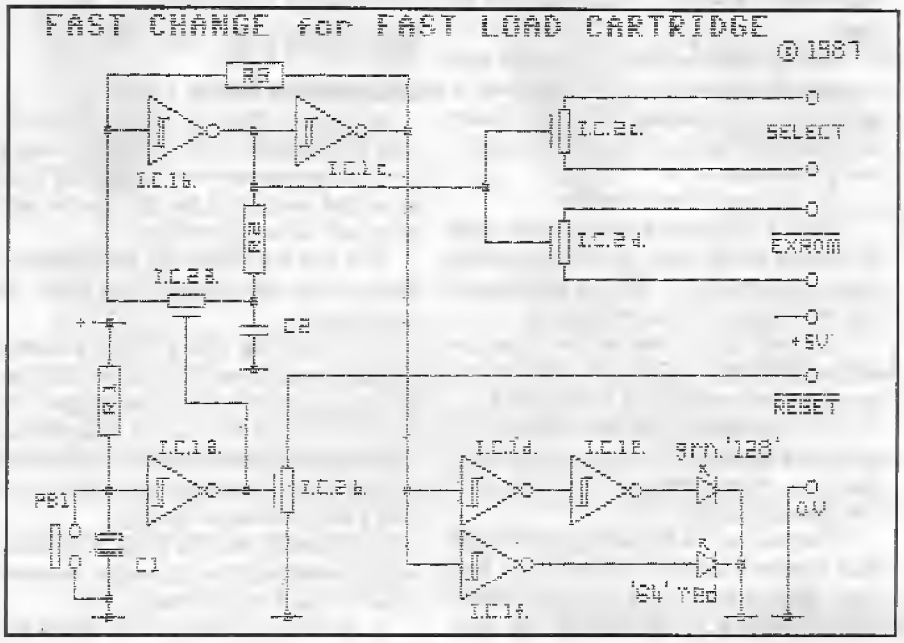
Fortunately most ROMs have an output 'select' pin (22 in this case) which effectively open circuits the data output buffers; second problem solved. I use a miniature high-speed power tool to drill printed circuits, grind plastic, etc. It is indispensible when discretely cutting p.c. tracks.

So I cut exrom and pin 22's connections and plugged the board into my 128. Eureka! It was as if the cartridge was not there. Everything functioned normally in 128 mode.

Next problem.

Simply reconnecting exrom and pin 22 would not initiate 64 mode, a reset pulse would be necessary. You can see how these things grow! A bit of checking revealed that in the 128 the reset pulse is





PARTS LIST

R1 470K
R2,3 220K
C1 1µ0 16V Tag
C2 100n Ceramic
IC1 4011BB
IC2 4066B

about half a second long, although holding the reset button in extends this for as long as it is held. I stuck to this scheme in my design.

The major problem to be overcome now was one of space.

Approximately 62mm by 22mm less allowance for various plastic projections. I wanted to use an electronic push-button, to allow the circuit to always power up in 64 mode, and a bi-colour led to indicate which mode is selected.

My first design would have occupied a board 75mm square! A bit of rethinking yielded the current design (which just fits) so I made a prototype and fitted it into my cartridge. Some extra benefits accrued from this modification.

Switching the Fast Load cartridge in and out is possible by holding down the Commodore key when switching to 128 mode.

Used in a 64 the FAST CHANGE button will perform this function and gives a convenient reset facility, although I have not tried this personally. The circuit is straightforward.

IC1 is a hex Schmitt inverter.

IC2 is a quad cmos transmission gate (or switch for its less technical description). At turn on C1 will be discharged and the output of IC1a will be high.

IC2b will be on and so the reset line will be held low. IC2a will also be on, coupling the low on C2 to IC1b's input.

IC1c reinforces this low through R3 latching IC1b when C1 has charged sufficiently to change the output of IC1a to a low (about 500mS).

IC2c and d are on during all this and thus connect exrom and select as normal. IC1d, e and f drive the leds. When PB1 is pressed, C1 discharges, the reset line goes low and IC2a connects C2 (which has since charged high through R2) to IC1b's input, causing IC1c to latch it through R3 when the reset pulse is gone.

IC2c and d will be off and exrom and select disconnected.

The FAST LOAD cartridge is now out of action and a 128 will be a 128 (if the Commodore key was up). Each press of PB1 thus inverts the state of IC1b and c and connects/disconnects the cartridge and resets the computer, hence FAST CHANGE.

The circuit is here for your personal use only, should you wish to make one up.

I have arranged with Computerscope at Hornsby to make updated cartridges available and to update previously purchased cartridges.

If there is sufficient interest I will make kits for the D.I.Y.'s available through Computerscope. My next project is likely to be a joystick selector for 64/128's with selection from several joysticks at the touch of a button.

I had thought about designing a cartridge motherboard system, but these are already available.

If you have any ideas for gadgets then let me know through the magazine or Computerscope at Hornsby. Have fun

Additional Instructions for Fast Load with Fast Change

1) When Used in a C-128

a) Follow "Getting Started" instructions supplied with FAST LOAD cartridge.

b) When you turn on your C128 it will be in C64 mode and the light on the cartridge will be red to indicate this.

c) If you are using C64 software then continue on with "Using Fast Load" instructions.

d) If you are using C128 software merely press the red FAST CHANGE button on the FAST LOAD cartridge. The light will change to green to indicate that 128 mode has been initiated. If you have a C128 disk in your disk drive at this time then it will commence loading.

e) Pressing the red FAST CHANGE button a second time will cause the computer to revert to C64 mode

f) Should you happen to have any C64 software that will not load successfully with FAST LOAD, from C64 mode press the red FAST CHANGE button whilst holding down the Commodore key at the bottom left-hand side of the keyboard. The light will change to green. When the computer has reset it will still be in C64 mode but the FAST LOAD cartridge will be disabled. This has much the same effect as typing <\,D> with the added enhancement that the FAST LOAD cartridge may be re-enabled by pressing the red FAST CHANGE button.

2) When used in a Commodore 64

a) Follow "Getting Started" instructions supplied with FAST LOAD cartridge.

b)When you turn on your C64 the FAST LOAD cartridge will be enabled and the light on the cartridge will be red to indicate this.

c) Continue on with "Using Fast Load" instructions.

d) Should you happen to have any C64 software that will not load successfully with FAST LOAD, press the red FAST CHANGE button. The light on the cartridge will change to green. When the computer has reset, the FAST LOAD cartridge will be disabled. This has much the same effect as typing <\,D> with the added enhancement that the FAST LOAD cartridge may be re-enabled by pressing the red FAST CHANGE button.

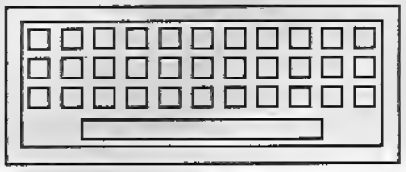
e) The FAST CHANGE button is a convenient way of resetting your C64. Just remember that you will need to press it twice if you wish to continue on with the same status, i.e. FAST LOAD on or off.

3) NOTES

a) The FAST LOAD functions are unavailable in C128 mode.

b) When the red FAST CHANGE button is pressed the computer is reset and valuable data will be lost if it has not been previously saved to disk or tape.

c) Now there really is no need to remove the FAST LOAD cartridge.



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Part 1

Machine Code Tutorial

Andrew Baines opens up the world of binary and other mysteries in this, the first of his regular tutorials on the subject.

IF you're tired of the speed of BASIC, maybe you should start programming in machine code!

One of the first questions that should be asked is what is machine code? When you sit down and write a BASIC program, the operating system is flashing the cursor and putting what you type on the screen.

This is all done in machine code, the language the machine (in our case the 6502/6510/8510 micro-processor) understands. Upon running your BASIC program, the computer looks at the first command and performs it by looking up the memory location for the command in a table and jumping to that location.

All of this is done in machine code, but things become bogged down when the '64 looks up the table.

Also string handling is a very complex and tedious task that takes considerable time.

The other way out is to obtain a good compiler like BLITZ and have your programs interpreted, all ready to run at blow-your-socks-off speeds. But this still isn't as good as pure machine code, which is faster yet.

Before we start learning the first few instructions of machine code, there are two other things which must be mentioned.

The first is that to program in machine language you must have an assembler.

The assembler will convert the 'mneumonics' (a big word for symbols) into the numbers that the 65XX can understand. Once a program is assembled in memory we can only understand it if it is disassembled back into mneumonics.

Eg: The instruction LDA #0 will be assembled as 169,0. When we disassemble it, it will be displayed as LDA #0 again.

Mnuemonics are used so we don't have to remember all the different numbers.

The second item to be devoured is Hex.

Most machine code programmers use a different number system called HEXADECIMAL. It is the base 16 number system. It is used because in hex there are only two digits needed to represent 256 different numbers.

Therefore, the first digit represents the first four bits of a byte, and the second digit represents the second 'nybble' of four bits in the byte.

In this way it is much easier to convert binary numbers into something more readable.

Table 1 shows the conversions from decimal to hex (this is the shortened version of the word HEXADECIMAL), and Table 2 shows a complete conversion for all numbers up to 65535.

You might have noticed that letters are used after we run out of the normal digits used in decimal. To indicate to your assembler that you are using hex, place a '$' in front of each hex number.

Most disassemblies will print in hex numbers, although some still stick to decimal. If you're an accomplished BASIC programmer, the best way to start is to learn the parallels between the two languages.

Table 3 shows these; you shouldn't have any problem with them. To use the logical operators listed in Table 1, we must have two numbers to operate with.

We could put one next to the instruction, but where is the other going to go? You might have noticed that the logical OR's syntax is actually ORA. The 'A' is the accumulator, one of the registers found in 65XX processors. The accumulator is the register capable of mathematical functions. NO OTHER REGISTER CAN PERFORM MATHEMATICAL FUNCTIONS.

The accumulator is the main register: it is used the most. How do we put numbers into it? By using the LoaD the Accumulator instruction, LDA. This must have a number or memory location after it.

The other command essential to the accumulator's use is the STore the Accumulator command: STA. This can only have a memory location after it.That's a lot to swallow in one paragraph, so we'll look at an example.

To change the screen colour to black, we must LoaD the Accumulator with zero, the number for black, and STore the Accumulator in the memory location 53281, the screen colour.

LDA #0

LoaD the Accumulator with the value zero. The # in the statement means a value follows, as opposed to a memory loca-

TABLE 1 - Decimal to Hex to Binary

Decimal	Hexadecimal	Binary
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

Table 1

TABLE 2 - Decimal to Hex

Hexadecimal conversion table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	00	000
0/	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	0	0
1/	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	256	4096
2/	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	512	8192
3/	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	768	12288
4/	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	1024	16384
5/	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	1280	20480
6/	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	1536	24576
7/	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	1792	28672
8/	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	2048	32768
9/	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	2304	36864
A/	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	2560	40960
B/	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	2816	45056
C/	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	3072	49152
D/	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	3328	53248
E/	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	3584	57344
F/	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	3840	61440

Table 2

tion.

STA 53281

STore the Accumulator in the VIC Chip's memory location for screen colour.

After this is complete, the screen will have turned black, and the accumulator will still have the value zero in it - it remains unchanged. So we can STore the Accumulator in the border register.

STA 53280

STore the Accumulator in the VIC Chip's memory location for border colour.

Now the screen and border are both black.

Remember the BASIC command for changing the border & screen colours?

POKE53281,0:POKE53280,0

Almost the same, isn't it.

The only difference is that we have to load a register with the desired colour and then save or store it in the memory location.

Let's try another example.

In this routine we will position sprite 0 at X=100, Y=100, set its colour to red (2) and turn it on.

First we have to set its pointer to page 200 (or any page, it doesn't really matter).

LDA #200

LoaD the Accumulator with the desired page number; we'll use 200.

STA 2040

STore the Accumulator in the pointer to sprite 0, 2040.

Next we'll set sprite 0's colour and position.

LDA #2

LoaD the Accumulator with the value 2, which represents red.

STA 53287

STore the Accumulator in sprite 0's location for colour, 53287.

LDA #100

LoaD the Accumulator with the value 100; this is where we want the sprite.

STA 53248

STore the Accumulator in the sprite 0 X position.

STA 53249

STore the Accumulator in the sprite 0 Y position. We can do this because the accumulator has not changed from when it was loaded with the value 100.

One more thing before we turn sprite 0 on. Because we want sprite 0 to appear on the left hand side of the screen, we will have to clear the MSB (Most Significant Bit) of sprite 0.

In this example we will clear all the sprite's MSBs.

LDA #0

LoaD the Accumulator with the value zero.

STA 53264

STore the Accumulator in the sprite's MSB location.

Now we are ready to turn on sprite 0. If you are good at programming sprites, this will be no problem. If you are a beginner, you may have problems in this area.

To calculate the value to be stored in the sprite enable memory location we have to raise two to the power of the sprite number. We want to turn on sprite 0. So we will raise 2^0=1. 1 is the value to turn on sprite 0 ONLY. To turn on other sprites, you have to perform this calculation for EACH sprite and add the results to obtain your answer. For now, we only want the value 1.

LDA #1

LoaD the Accumulator with the value 1.

STA 53269

STore the Accumulator in the memory location 53269 - the sprite enable location. To finish we will have to perform an RTS (ReTurn from Subroutine) instruction to return to BASIC.

RTS

One more thing - none of the routines presented can be run from BASIC. You will have to obtain a good assembler/monitor.

PAL is a very good assembler, and there are plenty of good monitors available.

Next month - a more detailed look at hexadecimal and the X and Y registers.

TABLE 3 - Basic & Machine Code Parallels

BASIC COMMAND	MACHINE CODE
GOTO(line)	= JMP(memory location)

This command will cause the program at (memory location) to be executed.

GOSUB(line) = JSR(memory location) This command will execute the program at (memory location) until a Return from Subroutine (RTS) instruction is encountered. Then the instruction after the JSR will be executed.

(a)AND(b) = AND(b)
Where (a) and (b) are the variables to be operated with.
Logical AND with the contents of the accumulator, leaving the result in the accumulator.

(a)OR(b) = ORA(b)
Where (a) and (b) are the variables to be operated with
Logical OR with the Accumulator, leaving the result in the accumulator.

RETURN = RTS
Return from Subroutine - used at the end of a program or subroutine to go back to the caller.

REM(remarks) = NOP
These two are almost the same in that they are both time wasters. NOP means no OPeration. It does nothing, except waste time. The REM statement wastes time, but it also lets you put remarks on your programs - NOP will not let you do this. NOP is simply there to waste time.

Table 3

The super page

by Paul Blair

Some more Superbase (SB) this month. I'm finding that a lot of users out there are mastering the standard menu system in SB quite well, and want to move on to do some programming for themselves. That's the next article, but before that, I think it might be a good time to do some revision, and write a few words about key fields.

LIKE any filing system, there has to be a key to every record - some method of ordering the records so that the information can be found and used again. Even a simple card index needs order, and so does SB.

The idea of a key is simple, and the notes provided in Dr Bruce Hunt's book about SB are worthy of study. I don't plan to repeat what he says, just add a few observations of my own.

At a guess, about 75 per cent of SB use is for names and addresses, with maybe some other information as well. And I would stick my neck out even further and suppose that most processing (entry of information, ordering, printing and so on) has some basis built on the use of surnames or maybe business names. There will be some that don't fit this description - I know of one SB user whose databases have postcodes as their principal theme, because he is into geographic/demographic studies, and postcodes best suit his filing needs.

But the use of surnames etc as key fields has an inbuilt problem. In a nutshell, there are often a number of duplicate surnames. In SB terms, this would mean having to elect to permit duplicate key fields. That's not bad in itself, but it does slow down some functions, e.g., creation of lists, and sorting. In fact, sorting can get quite tangled up if duplicate keys are in the file. The resulting sorted list may not be quite what you want.

What to do? Abandon the use of surnames as key fields? Add some sort of code to each surname, and so create home-made unique keys? Bruce Hunt suggests this as a work-around, and it could suit the design of your database.

But remember this - simplicity is paramount, because the whole idea of using a database program is ease of entry and subsequent retrieval. To keep brain work to a minimum, I prefer "intuitive" key fields, because the more natural the key, the easier your operation of the program will be. For that reason, I personally prefer not to use codes or index numbers in a database that is to record details about people. Heaven knows, Big Brother is close enough ...

So I prefer to use surnames. I might not be able to remember all the names, or even spell them correctly, but I can have a guess, try some phonetic spelling, and get pretty close to target. But numbers! I could spend all night trying to find someone in a big file. MATCH is always there, but if the surname is not a key field, then MATCH can be very slow.

> "At a guess, about 75 per cent of SB use is for names and addresses, but the use of surnames etc as key fields has an inbuilt problem."

At the cost of some storage space and speed when storing and sorting, I have used this next trick quite happily for some time. There are two variations, but both use the surname and initials of the "person" to be stored in the file as the "key".

Type 1 is the most compact. W F THOMAS would become "THOMAS W F" in my key field. This gives the fastest speed for nearly all later uses - listing, sorting and so on. But it is clumsier when it comes to output, especially mailing labels, club lists and so on, because I have to mess around a bit to move the "W F" back to its rightful place in front of THOMAS. It's not difficult, but it has to be thought of. The "&" truncation is very useful here.

I prefer my Type 2, although it does run a bit slower. In this type, I enter my key field as "THOMAS W F". The next entry, A N TAMPICO, would become "TAMPICO A N". The initials would always start at some selected fixed point, regardless of the number of characters in the surname. So we would eventually have:

ANGUS G B
TAMPICO A N
THOMAS W F

... and so on.

The wasted space is my only real concern, particularly if I'm trying to cram more stuff onto a disk. But formatting output is now a breeze, because I need only slice the last three characters off the back of the key field and add them to the front portion (I know its length - it's the key field length minus 3) and I have a simple format done.That suits me - it might not suit you, but you should think about these things when designing your next database, because ease of use has to be designed in by you. It is in your own interest, isn't it?

BUT IF YOU DON'T.....Index codes DO have a place. I can think of all sorts of uses of, say, a four digit code as a key field. My problem (one of them, anyway!!) is to remember which number I used last.

DUMP is a handy way to overcome this. Let me show you with an example. I will also give you a use for the CHECK command.

Suppose you plan to use four digits as the key field. The first index would be "0001", then "0002" etc. The number could be part numbers, invoices or whatever you want. The leading zeroes are

there to preserve order, because SB will sort invoice 16 ahead of invoice 2 if you don't include them.

The program works by reading a small file named "INDEX" from disk, which holds the last number used. It then adds one to the number, puts the number into the new key field, and waits for you to enter whatever else has to be entered.First, let's set up our little file. In direct mode (on the command line), type the following, then press RETURN

```
CLR:A$="0000":DUMP"0:INDEX"
```

With our index initialized, this is how we would program SB to (1) read the last number used, use it to get the new data, and re-store the most recent number on disk

```
*in4
90 REM: "KEYNAME" IS A KEY FIELD IN
MAIN FILE
100 SET"INDEX"
110 A=VAL(A$
)120
A=A+1:A$=RIGHT$(STR$(10000+A),4)
130CHECK"[KEYNAME]":DISPLAY"WRO
NG FILE":WAIT:FILE:RUN
140CLEAR:[KEYNAME]=A$:STORE:SEL
ECT A$:SELECT R
150 DUMP"0:INDEX"
160
ASK"CONTINUEABORT";Z$:IFZ$="C"TH
E110
170 MENU*in
```

Not long or difficult, but very handy.Next issue we will look at creating your own menu for the C64/C128. T

his can really make for tidy use of SB, especially if you are writing some routines for someone else.POKE'ing Superbasethough both the SUPERBASE manual and SUPERBASE-THE BOOK suggest that the POKE command is disallowed, I have found that there is a way to use it.This came about because a friend backs-up his SB data disks on his C64/8250 combination using a purpose written program which transposes files for him - today's summary becomes tomorrow's starting balance, and so on. But in so doing, the system waits for him to answer 'y' at just enough places to be tiresome. How to fix it?

The answer is simple - before (note - before) the line that requests confirmation as part of an internal process, POKE 'y' and a carriage return into the keyboard buffer. How? Answer - use PERFORM (or DO if you have an earlier version of SB) and there is no need for the program to pause.

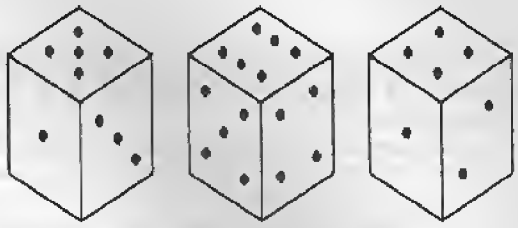
Try this little example:

```
*in4
10 REM: DEMO OF POKE IN SUPER-
BASE WITH DO/PERFORM
20 REM: THIS EXAMPLE ANSWERS "Y"
(ASCII 89)
30 REM: NOTE THAT REM CAN BE USED
ON SAME LINE AS PERFORM
40 REM: FOR C128 WITH C64 VALUES
SHOWN
50 REM: PAUL BLAIR MAY 87
60 PERFORM "POKE 842,89":
REM 631 IN C64
70 PERFORM "POKE 843,13":REM 632
IN C64
80 PERFORM "POKE 208,2":REM 198 IN
C64
90 ASK @2,2"WHICH ONE ";A$
100 DISPLAY @2,4 A$:WAIT
*in
```

Of course, there are probably thousands of other ways of using POKE. But be careful - unless you know every little last thing about how SB stores things, you could clobber some vital location. TEST FIRST!

By the way, I transpose routines into upper case for publishing reasons - I think it's easier to read. For the most part, the SB Program Writer is in lower case. Just type what you see, and put capital letters where they seem appropriate. Next month I'll try lower case - if you have a preference, let me know.

DICE ROLLER



by Andrew Baines

THIS short program (the data is the long part) will display, in large sprites, your roll of the dice. The individual dice rolls can be seen as text, and the total is the sprites.

Type in Listing 1 and save it. The second program to be typed and saved is the actual dice program itself (listing 2). Finally, the data has to be typed & saved. When you run, the data itself will be saved, if all is well.

If you wish to design your own sprites to save time typing, make pages 200-209 the numbers 0-9 respectively: eg page 205 has the data for the number 5.

Don't type in line 45 if your sprites are not multicolour.

To start, load the small program and run it (the other basic program must be named 'dice m'). It will load the sprite data from disk and the actual roller itself. To roll your dice, press the space bar. If your game is too far from the '64, then change line 65 to read:

65 J=PEEK (56320) :IF J=127 THEN 65

This changes the signal to roll to a joystick in port two. Moving the joystick in any direction, including pressing fire, will result in a roll occurring.

HOW IT WORKS - the loader

The first line checks to see if the sprite data is in memory, and if not, will load it.

Line 5 sets the border and screen to black. Now the interesting part!

In the '64, there are ten memory locations set aside as a keyboard queue or buffer. This is used so the machine doesn't lose any of the information entered at the keyboard. It works by you typing a key, and the value representing that key is put into the queue through interrupts. Next time the computer wants some input, it looks in the keyboard queue and finds what you typed there. But if you typed more than ten characters, the computer loses some, so you have to start again. This is no great problem, except where you have an extremely slow piece of software.

The keyboard queue uses memory locations 631 to 640 and 198 for holding its length.

So if we put 3 CHR$(13)'s (returns) in the queue, and we don't use the INPUT or GET or equivalent intructions to retrieve keys from the queue, whatever is on the screen will be entered, just like if you press return to enter 'run'. That is what the next line does. Then we print the commands on the screen (you won't see them because they're printed the same colour as the screen) and end the program, making sure that the cursor will fall in the right positions after every intruction.

Using this method, the program is loaded and run, all without the user having to do anything, or see anything.

HOW IT WORKS - the roller

Line 0 (yes, you can have line 0) pokes the screen black, just in case you stop the program to have a fiddle and the screen colours are not your favourite so you change them.

In line 1, the request is made for the number of dice to be rolled at once. Line 2 checks to see if you've tried to hang the program by giving it bad data, and if you have, it goes back to line 1. Lines 4 & 5 print the title, and line 6 makes lines 4 & 5 a subroutine if 'RE' is larger than zero, which at the beginning of the program is not so. The next part is the part where we set up the sprites. To set up a sprite, we have to:-

(a) set the position on the screen of the sprite
(b) set the colour of the sprite (and the multicolour registers if required)
(c) set state of the sprite
(1) multicolour/high resolution
(2) the size (whether or not you want it expanded)
(d) set the sprite pointers. To set the position on the screen, we must access two bytes and one bit for each sprite. These locations are:-

$D000	53248	Sprite 0 X position
$D001	53249	Sprite 0 Y position
$D002	53250	Sprite 1 X position
$D003	53251	Sprite 1 Y position
$D004	53252	Sprite 2 X position
$D005	53253	Sprite 2 Y position
$D006	53254	Sprite 3 X position
$D007	53255	Sprite 3 Y position
$D008	53256	Sprite 4 X position
$D009	53257	Sprite 4 Y position
$D00A	53258	Sprite 5 X position
$D00B	53259	Sprite 5 Y position
$D00C	53260	Sprite 6 X position
$D00D	53261	Sprite 6 Y position
$D00E	53262	Sprite 7 X position
$D00F	53263	Sprite 7 Y position
$D010	53264	MSB sprite X position

The Commodore 64 has 320 X-locations where sprites can be. Since one location can only hold 256 different combinations, we use an extra bit.

The location listed has one bit in it for every sprite. If that bit is on (set to 1) the sprite will be over in the far right of the screen (256-320). If it is off, the sprite will be in the left of the screen (0-256). Note that if you position your sprites too far to one side of the screen, they will disappear under the border. To solve this, Andrew Farrell has been on the 64 behind me for the past three days and he has just managed to make a sprite appear in the border, and has come up with some interesting effects in the process.

Sprite colours are exactly the same as screen or border colours, and the relevant locations appear below:-

$D025	53285	Sprite multicolour register 0
$D026	53286	Sprite multicolour register 1
$D027	53287	Sprite 0 colour
$D028	53288	Sprite 1 colour
$D029	53289	Sprite 2 colour

```
1 ifpeek(12802)<>84thenload"numbers mult
i",8,1
5 poke53280,0:poke53281,0
10 poke198,3:poke631,13:poke632,13:poke6
33,13
20 print"[CLR][BLK]"
30 print"[DOWN][DOWN]poke52,50:poke56,50
:poke642,8:poke44,8:poke2048,0:new"
40 print"[DOWN][DOWN]load"+chr$(34)+"dic
e m"+chr$(34)+",8"
50 print"[DOWN][DOWN][DOWN][DOWN]run":pr
int"[HOME][BLK]":new

ready.
```

MAIN PROGRAM

```
0 poke53280,0:poke53281,0
1 print"[CLR][GRN] how many dice at once
 (1-165)";:inputn
2 if(n<1)or(n>166)then1
4 print"[CLR][DOWN][DOWN][DOWN][DOWN][YE
L]         [C@][C@][C@][C@][C@][C@][C@][
C@][C@][C@][C@][C@][C@][C@][C@][C@][C@]"
5 print"         [RVON] the dice roller
[RVOF]"
6 ifrethenreturn
10 poke53248,88:poke53250,138:poke53252,
188
20 poke53249,135:poke53251,135:poke53253
,135
30 poke53264,0:poke2040,200:poke2041,200
:poke2042,200
40 poke53287,2:poke53288,2:poke53289,2
45 poke53276,7:poke53285,12:poke53286,11
50 poke53277,255:poke53271,255
60 poke53269,7
65 geta$:ifa$=""then65
66 ifa$="[F1]"thenrun
70 gosub200
75 poke53269,0
80 b$=str$(a):poke2040,200:poke2041,200:
poke2042,200
85 b$=right$(b$,len(b$)-1)
87 iflen(b$)<3thenb$="0"+b$:goto87
90 fori=1tolen(b$)
100 poke2039+i,200+val(mid$(b$,i,1))
110 next
115 poke53269,7
120 goto65
200 re=1:gosub4:print"[HOME][DOWN][DOWN]
[DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOW
N][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][D
OWN][DOWN]":a=0
210 fori=1ton
220 b=int(6*rnd(1))+1
230 printb,:a=a+b:next:return

ready.
```

```
10 i=12800
20 read a:if a=256 then 40
25 ch=ch+a
30 poke i,a:i=i+1:goto 20
40 ifch<>109443thenprint"error in data":
end
50 open15,8,15,"i0"
60 open3,8,1,"0:numbers multi,p,w"
70 poke157,128:poke251,0:poke252,50
80 poke780,251:poke781,198:poke782,52
90 sys65496:close3:close15:end
12800 data 85,85,84,127,255,254,127,255
12808 data 254,127,255,254,127,255,254,1
27
12816 data 255,254,127,255,254,127,255,2
54
12824 data 127,255,254,126,170,126,126,0
12832 data 126,125,85,126,127,255,254,12
7
12840 data 255,254,127,255,254,127,255,2
54
12848 data 127,255,254,127,255,254,127,2
55
12856 data 254,127,255,254,42,170,170,25
5
12864 data 1,85,0,1,255,128,1,255
12872 data 128,1,255,128,1,255,128,1
12880 data 255,128,1,255,128,1,255,128
12888 data 1,255,128,1,255,128,1,255
12896 data 128,1,255,128,1,255,128,1
12904 data 255,128,1,255,128,1,255,128
12912 data 1,255,128,1,255,128,1,255
12920 data 128,1,255,128,0,170,128,255
12928 data 85,85,84,127,255,254,127,255
12936 data 254,127,255,254,127,255,254,4
2
12944 data 170,126,0,0,126,85,85,126
12952 data 127,255,254,127,255,254,127,2
55
12960 data 254,127,255,254,127,255,254,1
26
12968 data 170,170,126,0,0,125,85,84
12976 data 127,255,254,127,255,254,127,2
55
12984 data 254,127,255,254,42,170,170,25
5
12992 data 85,85,84,127,255,254,127,255
13000 data 254,127,255,254,127,255,254,4
2
13008 data 169,254,0,1,254,85,85,254
13016 data 127,255,254,127,255,254,127,2
55
13024 data 254,127,255,254,127,255,254,4
2
13032 data 169,254,0,1,254,85,85,254
13040 data 127,255,254,127,255,254,127,2
55
13048 data 254,127,255,254,42,170,170,25
5
13056 data 84,0,84,126,0,126,126,0
13064 data 126,126,0,126,126,0,126,126
13072 data 0,126,125,85,126,127,255,254
13080 data 127,255,254,127,255,254,127,2
55
13088 data 254,127,255,254,127,255,254,4
2
13096 data 170,126,0,0,126,0,0,126
13104 data 0,0,126,0,0,126,0,0
13112 data 126,0,0,126,0,0,42,255
13120 data 85,85,84,127,255,254,127,255
13128 data 254,127,255,254,127,255,254,1
26
13136 data 170,170,126,0,0,125,85,84
13144 data 127,255,254,127,255,254,127,2
55
13152 data 254,127,255,254,127,255,254,4
2
13160 data 170,126,0,0,126,85,85,126
13168 data 127,255,254,127,255,254,127,2
55
13176 data 254,127,255,254,42,170,170,25
5
13184 data 85,85,84,127,255,254,127,255
13192 data 254,127,255,254,127,255,254,1
27
13200 data 170,170,127,128,0,127,85,84
13208 data 127,255,254,127,255,254,127,2
55
13216 data 254,127,255,254,127,255,254,1
27
13224 data 170,126,127,128,126,127,85,12
6
13232 data 127,255,254,127,255,254,127,2
```

```
55
13240 data 254,127,255,254,42,170,170,25
5
13248 data 85,85,84,127,255,254,127,255
13256 data 254,127,255,254,127,255,254,1
27
13264 data 255,254,42,169,254,0,1,254
13272 data 0,1,254,0,1,254,0,1
13280 data 254,0,1,254,0,1,254,0
13288 data 1,254,0,1,254,0,1,254
13296 data 0,1,254,0,1,254,0,1
13304 data 254,0,1,254,0,0,170,255
13312 data 85,85,84,127,255,254,127,255
13320 data 254,127,255,254,127,255,254,1
26
13328 data 170,126,126,0,126,125,85,126
13336 data 127,255,254,127,255,254,31,25
5
13344 data 248,127,255,254,127,255,254,1
26
13352 data 170,126,126,0,126,125,85,126
13360 data 127,255,254,127,255,254,127,2
55
13368 data 254,127,255,254,42,170,170,25
5
13376 data 85,85,84,127,255,254,127,255
13384 data 254,127,255,254,127,255,254,1
26
13392 data 170,126,126,0,126,125,85,126
13400 data 127,255,254,127,255,254,127,2
55
13408 data 254,127,255,254,127,255,254,4
2
13416 data 170,126,0,0,126,85,85,126
13424 data 127,255,254,127,255,254,127,2
55
13432 data 254,127,255,254,42,170,170,25
5
13440 data 255,255,255,255,255,255,255,2
55
13448 data 255,255,255,254,255,255,255,2
55
13456 data 255,255,255,255,255,255,255,2
55
13464 data 255,255,255,254,255,255,255,2
55
13472 data 24,0,0,0,0,0,0,0
13480 data 0,0,0,1,0,0,0,0
13488 data 0,0,0,0,0,0,0,0
13496 data 0,0,0,1,0,0,0,0
13504 data 255,256

ready.
```

$D02A 53290 Sprite 3 colour
$D02B 53291 Sprite 4 colour
$D02C 53292 Sprite 5 colour
$D02D 53293 Sprite 6 colour
$D02E 53294 Sprite 7 colour

The multicolour registers only have to be used if you are using multicolour sprites. Otherwise, you can leave them to themselves. To obtain multicolour sprites, this location must be used:-
$D01C 53276 Multicolour sprite select.

Because there are eight sprites, one bit is used for each sprite. If bit 1 is set to 1, sprite 1 will be multicolour. Multicolour means that you can display four different colours in the one sprite, at a loss of x-resolution. Each sprite's data has 24 pixels across. If the multicolour mode for a sprite is turned on, that sprite's number of pixels will be reduced to 12, but its size will remain the same, meaning you have jagged edges on it. In a normal sprite, if a bit is one, the sprite's colour will be shown. If it is zero, the screen colour (or text if it is there) will be shown.

In a multicolour sprite, there are four possible colours, and to store all these colours two bits must be used in the following pattern:-

00 - screen colour (transparent)
01 - multicolour 0
10 - multicolour 1
11 - sprite colour

So when you design your sprite with your sprite editor, instead of being able to control 24 pixels across with 2 colours, you will be able to control 12 pixels across with 4 colours. The jagged edge problem can be solved by putting two sprites in the one place, the lowest number sprite will be displayed on top, so you should make that one high resolution, and the other multicolour and have the top one cover those nasty edges with nice smooth ones.

Expanding sprites is easy. There are two registers required for the two different directions (X and Y):-

$D017 53271 Sprite expand in Y-direction.
$D01D 53277 Sprite expand in X-direction.

These registers work the same way as the multicolour select register: ie if bit 1 is set, sprite 1 is expanded for that direction. Lots of interesting effects can be obtained by using these registers.

The sprite pointers are what stops most people from using sprites. A sprite is 63 bytes long. It is laid out like this:-

byte1 byte2 byte3
byte4 byte5 byte6
.....
byte61 byte62 byte63

The location of byte one is the location we're interested in. By dividing it by 64, we come up with the page number of the sprite. This number is poked into the sprite pointers at 2040-2047.

Example: You have just designed a sprite, and it starts at location 12288. 12288/64=192. Therefore, if your sprite is to be sprite 3, POKE2043,192. Most sprite editors display the page number on the screen, saving you calculating it.

$07F8 2040 Pointer to sprite 0
$07F9 2041 Pointer to sprite 1
$07FA 2042 Pointer to sprite 2
$07FB 2043 Pointer to sprite 3
$07FC 2044 Pointer to sprite 4
$07FD 2045 Pointer to sprite 5
$07FE 2046 Pointer to sprite 6
$07FF 2047 Pointer to sprite 7

On with our program!

Lines 10 and 20 set the positions of the three sprites we will be using. Line 30 sets the Most significant bit of the X-position of all sprites to zero, and sets all the sprite pointers to 200, the area containing the numeral 0. Sprite colour is the next thing we will set, in line 40. Line 45 sets the multicolour for sprites 0, 1 & 2 on, and sets the multicolour registers to two different shades of grey.

In line 50, we make all sprites expand in both directions, and finally in line 60, we turn sprites 0, 1 & 2 on. Line 65 accepts input, and line 66 checks to see if 'F1' was pressed. If it was, RUN. If not, line 70 visits line 200.

This subroutine selects each dice's number through the random function, prints all the individual scores, and tallys them. You might be wondering what the comma in line 230 does. This tells the

computer to print at the next available TAB. These are 0,10,20,30. So next time something is printed, it will sit on the same line as the previous number (unless the previous number was 30) in the next tab position. Example. One number is printed in TAB position 0. The next will be printed on the same line, in tab position 10.

Now that we have calculated the total, we have to put this value on the screen through the sprites.

The variable A holds the total. Line 75 turns the sprites off, so that you can see that a roll has taken place. B$ is then made from the variable A, and one character is then chopped off from the right of B$. This is done because the '64 always adds a space to the front of strings. This is not needed in our program, so it is eliminated.

Line 87 makes sure that there is three characters in B$, even if the first two are '0'. Lines 90-110 poke the pointers with the proper numbers from B$+200, and finally, line 115 turns the sprites back on, and the program goes back for another roll.

If you don't understand fully the string handling lines, don't worry, the main point of this program was to demonstrate the use of sprites in areas other than games. If you don't really understand sprites yet, try rereading, its amazing how much you pick up the second time!

Part 1
Basic is easy

Andrew Farrell introduces the world's most popular programming language to budding programmers.

ALMOST all home computers have BASIC built in, or available in some form or other. The Commodore 64 is no exception, with an abstract of Microsoft BASIC ready to run on power up.

BASIC is the language for all of us who use computers. For one thing, it's not unlike English. Many of the commands and statements are easy to understand. They do what it sounds as if they do.

And you don't even need to write a program to try a few of these out. Some commands will work directly. You simply type them straight into the computer and press return.

This is called DIRECT MODE.

Here's a simple example you can try. Switch on your computer and type what you see straight in. The inverted commas are obtaind by pressing the shift and two key simultaneously.

PRINT "HELLO"

Remember to press the RETURN key at the end of the line . You should see the word 'HELLO' printed immediately below what you entered.

The PRINT command you've just used puts text on the screen. Anything between the two inverted commas is printed on the screen exactly as you typed it.

The Commodore has special graphics, symbols and even colour or cursor controls, which may be included in a print statement.

Try this example now:

PRINT "GOODNIGHT","HELLO"

Notice what's happened?The comma between each set of inverted commas tells the computer to move to the next TAB position before printing. It's possible to use other ways to position text exactly where you want it. That way things don't end up all over the screen.

You can also use the print statement to display numbers.

Try these for style:

PRINT 2PRINT 4 + 2PRINT 27/3.

You'll notice we used the forward slash in the last line. In BASIC this stands for divided by.

To multiply numbers, use the asterisk symbol. Differences with the examples we've just given you, the computer would have printed 2, 6 and 9. The sums were calculated and the result printed rather than the actual sum.

Notice the difference:

PRINT 8*6PRINT "8*6"

Without the inverted commas, the numbers are interpreted and the answer calculated. With inverted commas, everything is printed exactly as it appears between the quotes.

Using our examples, as soon as you press RETURN at the end of each line, the BASIC interpreter tries to make sense of what you have typed.

In a program each command is given a line number. This is not interpreted until the computer is ready to deal with that particular entry.

Computers don't speak in BASIC. They much prefer machine language, their native tongue. To us humans, this is nothing more than a meaningless string of zero's and one's.

To help, an interpreter is provided. When you ask the computer to execute a BASIC program or command, the interpreter goes to work. Each instruction must be found in a list. Each part associated with that particular command is fetched. Once all the necessary variables have been located, the whole lot is executed.This process is very time consuming and involves a lot of jumping to and fro. Thus, BASIC is very slow.

Games require many different tasks to appear to happen simultaneously. BASIC is just not up to scratch for these types of programs.

However, there's still a lot we can do.

Let's take a look at a few more commands. Earlier on we used PRINT. If we add line numbers, this command becomes more powerful. Enter these lines into your computer. Remember to press the RETURN or ENTER key at the end of each line.

```
10 PRINT "Hello Bill Pike"
20 GOTO 10
```

The number at the start of each line sets the order in which everything is stored and executed. We can jump to a particular line using the GOTO command. In our example, line 20 simply tells the computer to go back and start again at line 10.

Type RUN to test out your program. You should see the phrase "Hello Bill Pike" appear down the left hand side of the screen. Try using your editing keys to add a semicolon (";") after the last set of inverted commas at the end of line 10. This time your entire screen should fill with the text between the quotation marks.

It's a little awkward to change line 10 whenever we want a different message. Here's a new command to make things easier. INPUT - for getting information into the computer. You can INPUT from the keyboard, disk drive or cassette player.

Normally, BASIC uses the keyboard.

To INPUT, we also need a place to store information. By naming this space a small area is set aside ready for use. Since what is contained in these spaces may change, BASIC calls them variables.

Here's an example:-

```
10 INPUT NA$
20 PRINT "Hello "NA$
30 GOTO 20
```

Now you can enter your name.

Line 20 prints "Hello", followed by whatever you typed. Line 30 jumps back to line 20.

In line 10 we INPUT the variable NA$. The dollar sign means that the variable may contain text. BASIC sets aside NA$ in memory and a special pointer says where to store what you enter.

Most versions of BASIC allow you to use meaningful names for variables.

Instead of NA$ we could have used NAME$. Only the first two letters are significant when naming a variable. NAME$ and NAP$ would be the same.

Variables may also be numeric. Leave off the dollar sign and only a number may be entered into our above example. Here's another example :-

AMOUNT = 6C = 2A1 = 2.5

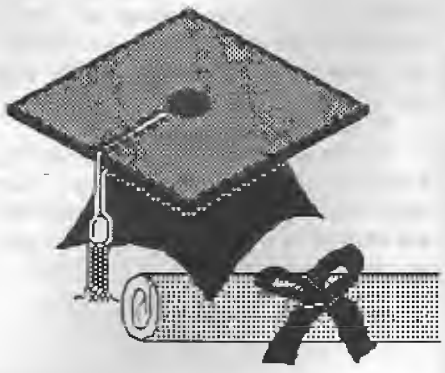
Variable names may include numbers after the first letter.

You must not use any special characters such as an exclamation mark. Numeric variable can be added, multiplied, divided or subtracted just like numbers. For example :-

C = 2D = 4PRINT C + D

Just press return at the end of each line.

You should see the result of 6 displayed above the READY prompt. Ready tells us that the computer has finished, and is ready to go on with something new. Next month, we'll put our knowledge to work and make a small program to calculate times tables.



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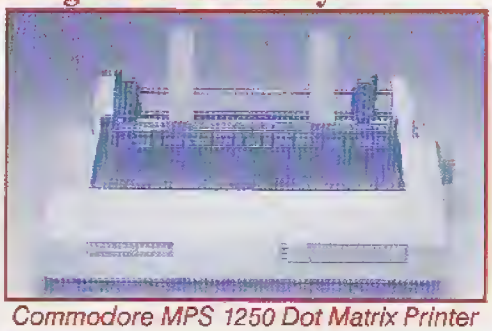

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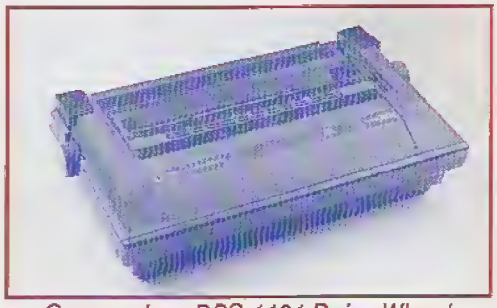

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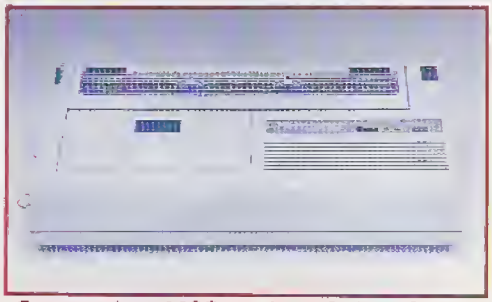

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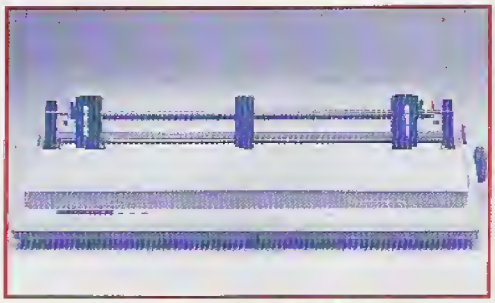

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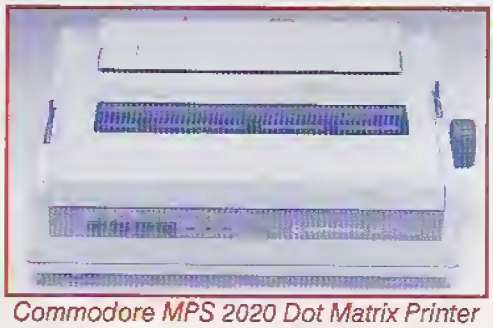

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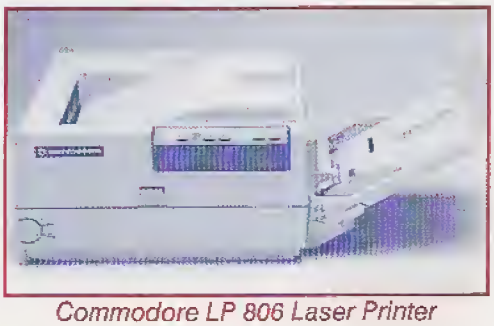

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